ENVIRONMENTAL COUNTRY PROFILE FOR SHELTER AND SETTLEMENT RESPONSE

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GLOBAL SHELTER CLUSTER
Coordinating Humanitarian Shelter and Settlements

MYANMAR SHELTER CLUSTER
Coordinating Humanitarian Shelter and Settlements

CCCM CLUSTER Myanmar

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ABOUT THE MYANMAR ENVIRONMENTAL COUNTRY PROFILE

The Myanmar Environmental Country Profile (ECP) offers practical guidance for Shelter/NFI/CCCM Cluster partners in Myanmar, focusing on integrating environmental sustainability into shelter and settlement interventions. Organized into 11 chapters, it provides topic-specific insights and a checklist of recommendations aligned with the Myanmar Clusters' Environmental Action Plan. This checklist outlines actionable steps to minimize environmental impacts throughout project implementation, from planning to monitoring. It is available in this offline version and as a live online version HERE. The online version is the most up-to-date version of the Profile.

The ECP's chapters provide in-depth analyses and conclusions on specific environmental topics relevant to shelter and settlement interventions. Each chapter delves into critical environmental issues and offers developed conclusions to guide decision-making, ensuring that interventions remain aligned with environmental best practices.

Additionally, the online ECP features a document that compiles multiple references where partners can find a curated list of the documents included in every chapter's resources folder. These documents are liste with highlighted basic information to make it easier for users to identify relevant materials quickly. The full Google Drive repository offers direct access to these resources, with frequent updates to ensure that the most current and relevant information is available.

In light of Myanmar's growing environmental and humanitarian challenges, the Environmental Country Profile (ECP) is intended to support the Cluster Environmental Action Plan (EAP) efforts (see below). By complementing the foundational principles established in the EAP, the ECP provides practical guidance, tools, and resources for Cluster partners to integrate environmental sustainability into shelter and settlement interventions effectively.

Central to this profile is the inclusion of a checklist (see below), aligned with Cluster's EAP goals, which facilitates the decision making process for integrating environmental considerations in all stages of project implementation.

As a living document, the profile evolves over time, incorporating new data and resources as they become available. Shelter Cluster partners are encouraged to share their experiences and insights, fostering a collaborative effort to keep the profile dynamic and responsive to the changing environmental landscape in Myanmar. By leveraging this tool, partners can contribute to solutions that are environmentally sustainable while addressing the immediate humanitarian needs of affected communities.

UPDATING FREQUENCY

To ensure that the Myanmar Environmental Country Profile remains a valuable and up-to-date resource, the Shelter Cluster Coordination team is responsible for regularly uploading new and updated documents to the profile's Google Drive folder as soon as they become available. Partners are encouraged to share any new documents, reports, or relevant information with the Coordination team to ensure comprehensive coverage of all relevant topics. If significant updates or new challenges arise, the Technical Working Group (TWG) may be reactivated to review and revise the profile, ensuring it continues to meet the evolving needs of Shelter Cluster partners and supports effective, environmentally sustainable programming.

INTRODUCTION TO MYANMAR CONTEXT

Myanmar faces a complex and challenging environment, marked by heightened vulnerability to natural hazards and the escalating impacts of climate change. These environmental challenges are further compounded by an ongoing humanitarian crisis that has deepened in recent years. As a country with diverse topography, Myanmar is exposed to a wide range of natural hazards, including heatwaves, floods, cyclones, and earthquakes, which have profound implications for shelter and settlements.

In the latest update to the Global Climate Risk Index (2021), Myanmar was identified as the second most affected country globally over the past two decades. This ranking reflects the frequency and severity of climate-related disasters that have struck the country, devastating communities and their living conditions. Recent events, such as Cyclone Mocha in May 2023, which affected over 3 million people, and the widespread flooding during the 2023 monsoon season, have exacerbated the already dire shelter and settlement challenges. With approximately 28 million people residing in high flood exposure risk zones, the evolving patterns of these hazards, driven by climate change, present an ever-growing threat to safe and sustainable shelter for Myanmar's population.

The situation is further worsened by the ongoing humanitarian crisis, which has seen a significant deterioration in the second quarter of 2024 due to escalating armed conflict, the impact of Typhoon Yagi and floods, and overall economic and political instability. The resultant displacement crisis is severe, with 3.2 million people displaced from their homes by mid-2024, an increase of over 320,000 in just a few months. Many of these newly displaced individuals have been forced to seek refuge in temporary shelters and informal settlements, where the availability of secure, adequate, and sustainable housing is gravely insufficient. These conditions are exacerbated by restricted access to essential services, including health and education, in conflict-affected and remote areas, further highlighting the critical need for effective shelter and settlement interventions.

In this context, the challenge of providing safe and sustainable shelter is immense. The increasing frequency of natural disasters, combined with the ongoing displacement crisis, severely threatens the ability of vulnerable populations to secure adequate shelter. The deteriorating situation not only endangers lives but also significantly hinders long-term recovery and development efforts, making the need for resilient and environmentally sustainable shelter solutions more urgent than ever.

INTRODUCTION TO THE SHELTER/NFI/CCCM CLUSTER

The Shelter/NFI/CCCM Cluster in Myanmar is dedicated to ensuring that individuals affected by conflict and natural disasters have access to safe, dignified, and appropriate living conditions, alongside essential services. Central to its mission is a commitment to environmental sustainability, recognizing the importance of minimizing the ecological impact of shelter and settlement interventions while protecting both vulnerable populations and their surrounding ecosystems.

To guide this effort, the Cluster's Environmental Action Plan (EAP) for 2024 outlines a strategic approach for partners. The plan emphasizes sustainable shelter construction using eco-friendly materials and techniques, alongside integrating Nature-Based Solutions (NBS) to enhance resilience. This framework ensures that humanitarian responses are not only effective in addressing immediate needs but also contribute to long-term environmental stewardship.

CHECKLIST

The Environmental Country Profile Checklist is a practical tool aligned with the Myanmar Clusters' Environmental Action Plan. It is designed to help Shelter/NFI/CCCM Cluster partners integrate environmental sustainability into their interventions by providing specific activities tailored to preparedness, response planning, and response implementation phases. Each checklist item corresponds to actionable recommendations supported by specific ECP chapters and offers a structured, step-by-step approach to minimizing environmental impacts. By following this checklist, partners can systematically address key environmental considerations, ensuring their activities not only meet humanitarian goals but also support long-term sustainable development.

MYANMAR ECP CHECKLIST					
No	EAP Principle	Action	Activities recommended	When	ECP Chapter
1	Environmental Context	Integrate climate and environmental data	Use climate projections and historical data to ensure climate-resilient projects	Preparedness and response planning	1, 2
			Link climate data integration with participatory approaches to address local risks.	Preparedness and response planning	1, 2, 4, 5, 6
			Work with authorities and organizations for cohesive planning and implementation	Preparedness, response planning and response implementation	1, 2, 3, 4
		Carry out environmental screening for the area/site	Assessment carried out using NEAT+ tool	Preparedness and response planning	1, 4
			Analysis of natural resources available in the area and potential hazards	Preparedness and response planning	1, 2, 4
			Identify environmental impacts of shelter activities and prevent degradation	Preparedness, response implementation and evaluation	1, 2, 4
		Develop early warning systems	Deploy systems for extreme weather events and connect with local networks	Preparedness	1, 2, 3
		Empower communities	Build capacity for adaptation and preparedness with training and engagement	Preparedness and response implementation	1, 2, 10
		Avoid ecologically sensitive areas	Prioritize avoiding wetlands, protected forests, and wildlife corridors	Response planning	1, 2, 6
2	Material Sourcing	Use sustainable materials	Use locally sourced, renewable materials like bamboo to reduce deforestation	Response planning	1, 2, 5, 9

		Use materials sourced from responsibly managed forests, recycled content, or rapidly renewable resources	Use of certified sustainable sourced timber/wood/bamboo	Response implementation	1, 2, 5
			Use of debris for construction or reconstruction of shelters	Response planning and implementation	1, 5
3	Carbon Emissions	Prioritize materials with low carbon footprint, considering emissions from production, transportation, and overall life cycle	Procurement of materials in the local market	Response planning and implementation	1, 5, 7
			Procurement of materials produced locally	Response planning and implementation	1, 5, 7
			Provision of cash for purchase of materials in the local market	Response planning and implementation	1, 5, 7
			Use of scorecard for materials to choose those with lower carbon footprint	Response planning	1, 5, 7
			Preference for durable and quality items in opposed to cheap and low lifespan	Response planning and implementation	1, 5, 7
		Optimize logistics and travel to reduce carbon emissions related with transportation	Use of full capacity of trucks for transportation of items and materials	Response implementation	1, 5, 7, 8
			Coordinate with other programs/clusters for joint distributions and optimization of transportation of items	Response planning and implementation	1, 5, 7, 8
			Reduction of air travel where possible	Response planning and implementation	1, 8
			Adopt fuel-efficient vehicles and logistical innovations.	Response planning and implementation	1, 8
4	Waste Management	Setting up of solid waste management at distribution/construction locations	Demarcation of space for waste collection in the distribution location	Response implementation	1, 5, 7
			Coordination with WASH partners to collect waste from distribution	Response planning and implementation	1, 5, 7
			Sorting waste in distribution sites, offices and in communal buildings and connecting with local	Response implementation	1, 5, 7

			recyclable waste collection systems		
		Develop a plan to increase lifespan of materials or ensure its recycling or reusing	Add a layer of palm leaves or thatch on top of tarps to increase lifespan	Response implementation	1, 5
			Selection of NFI kits packaging that can be reused by beneficiaries	Response planning	1, 7
		Packaging for shelter/NFIs minimized and packaging without an immediate use is recovered and reused, repurposed or recycled	Avoid the use of single use plastic bags for procured items	Response planning and implementation	1, 5, 7
			Collection of plastic bags for fabrication of mats	Response planning and implementation	1, 7, 9
5	**Design**	Promote resilient construction practices	Use techniques and materials resilient to climate impacts (elevated structures, durable materials)	Response planning and implementation	1, 5, 6, 9
			Choose sustainable options to reduce ecological footprint	Response planning and implementation	1, 5, 6, 9
		Design adaptable shelters	Create durable, multifunctional shelters resilient to long-term climate changes	Response planning and implementation	1, 5, 9
		Design shelters with passive strategies to enhance natural ventilation, improve thermal comfort and lighting	Windows and openings incorporated in the shelter design for air circulation	Response implementation	1, 5, 9
			Shelter roof design adapted for sky window	Response implementation	1, 5, 9
		Improve shelter structural systems to minimize material use while maintaining technical performance	Maximized shelter structural spans considering the thickness of materials or elements	Response implementation	1, 5
			Improve and strengthen shelter structural joints to increase technical performance	Response implementation	1, 5
		Integrate NBS into shelter and settlement designs	Maximize environmental and social benefits of designs through NBS interventions	Response planning and implementation	1, 5, 9

		Design green infrastructure	Include permeable pavements and green spaces in settlements	Response implementation	1, 6, 9
6	**Energy**	Developing a plan to reduce the use of wood for cooking and promote renewable energies for lighting and heating	Implementation of bamboo charcoal training	Response planning and implementation	1, 8
			Distribution of Fuel-Efficient Stoves	Response planning and implementation	1, 8
		Use renewable energy	Integrate renewable solutions like solar power in projects	Response planning and implementation	1, 5, 6, 7, 8
		Implement energy-saving in offices	Use energy-efficient lighting and renewable systems	Response planning and implementation	1, 5, 6, 7, 8
7	**Local Resources**	Reforestation and soil conservation	Engage communities in initiatives like resource management	Response planning and implementation	1, 9
			Training for bamboo suppliers on Sustainable Forestry Management	Response planning and implementation	1, 5, 9
			Select sites that support reforestation and engage communities	Response implementation	1, 6, 9
			Link reforestation and conservation with shelter, NFIs and CCCM activities	Response planning and implementation	1, 2, 3, 5, 6, 7, 9
		Partner with conservation groups	Align interventions with conservation goals for better outcomes	Response planning and implementation	1, 2, 3, 5, 6, 7, 8, 9

01

ENVIRONMENTAL DEGRADATION AND CLIMATE CHANGE RISK

Myanmar's environmental and climate challenges are compounded by an ongoing insecurity crisis, which further exacerbates the vulnerability of its population. The country is highly exposed to extreme weather events such as cyclones, floods, droughts, and heatwaves. The degradation of natural resources, deforestation, and land misuse, coupled with rapid population growth and economic dependency on climate-sensitive sectors like agriculture, further amplify the risks.

The current insecurity crisis intensifies these vulnerabilities by disrupting access to resources, displacing communities, and straining humanitarian responses. This ongoing crisis not only complicates the delivery of aid but also increases the pressure on already fragile environmental systems. As shelter and settlement practitioners work to address the immediate needs of displaced and affected populations, they must also consider the broader implications of environmental degradation and climate change on their interventions.

Figure 3
The environmental issues affecting one settlement are usually multi-dimensional
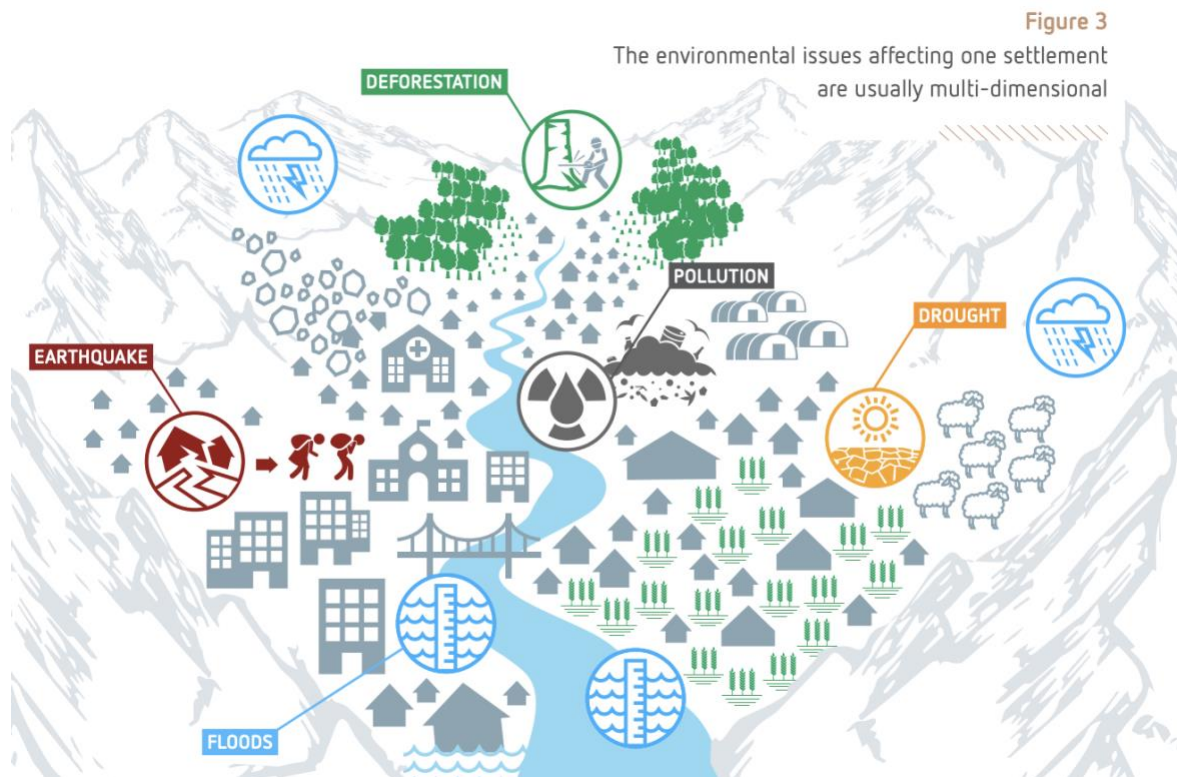
Addressing environmental concerns through the Settlements Approach
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Effective shelter and settlement planning in Myanmar must account for these complex dynamics. The ECP checklist summarizes recommendations to guide practitioners in integrating climate resilience into their projects. It covers strategies for addressing environmental impacts and adapting to the multifaceted challenges posed by both environmental and security crises.

Summary of the key environmental issues facing Myanmar

1. **Extreme weather events**: Myanmar is highly vulnerable to a range of extreme weather events, including cyclones, floods, and heatwaves. These disasters have profound and often devastating consequences for shelter, displacement, and overall humanitarian needs:

   ● **Cyclone Nargis (2008)**: The deadliest cyclone in Myanmar's recorded history, Cyclone Nargis claimed around 138,000 lives and left 19,359 people injured. The cyclone destroyed over 450,000 homes and severely damaged 350,000 more, displacing millions and creating a prolonged humanitarian crisis.
   ● **Cyclone Giri (2010):** Striking the western coast, Cyclone Giri affected 260,000 people, displacing tens of thousands and leaving large swaths of the population in need of urgent shelter and humanitarian support.

- **Cyclone Mocha (2023):** One of the most destructive cyclones in recent years, Cyclone Mocha displaced thousands of people, with more than 162,000 homes either completely or partially destroyed. Over 205 sites were severely damaged, exacerbating vulnerabilities and sharply increasing the need for humanitarian assistance, particularly in Rakhine State.
- **Typhoon Yagi (2024):** In September 2024, this recent powerful storm had severe impacts across Southeast Asia. In Myanmar alone, in conjunction with heavy monsoon rains, Typhoon Yagi triggered flooding and landslides which is estimated to have affected 2.4 million people (4.4 percent of the population), resulting in 184 deaths across 192 townships. About 20 percent of total built-up structures (more than half a million buildings) and nearly 10 percent of Myanmar's roads were affected by the floods, alongside damages to other infrastructure.

2. **Natural resource degradation**: In Myanmar, several natural resources linked to shelter and settlements are particularly scarce due to deforestation, land misuse, and overexploitation (more detailed information about construction materials in Chapter 5) :

- **Timber**: The widespread reliance on timber for shelter construction, especially in remote areas, has led to significant deforestation and habitat loss. The unsustainable harvesting of timber not only threatens wildlife but also undermines the long-term sustainability of forest ecosystems. Reduced tree cover compromises carbon sequestration, biodiversity, and the overall health of forest ecosystems. During FGDs carried by Cluster partners, participants in Pay Tha La Camp, Chin State reported limited access to timber, necessitating the use of salvaged wood for shelter repairs (see more in FGD Report in Chapter 4).
- **Firewood**: Many communities in Myanmar rely on firewood for cooking and heating, contributing to the rapid depletion of forest resources. The demand for firewood exacerbates deforestation, especially in rural areas, which can further disrupt local ecosystems and increase vulnerability to soil erosion.
- **Bamboo**: Although bamboo is a fast-growing, renewable resource traditionally used in shelter construction, there is a risk of overharvesting in certain regions where it is in high demand. While bamboo is generally more sustainable than timber, it still requires careful management to ensure its availability for future use, balancing the community's needs with sustainability. During FGDs carried by Cluster partners, in Hpa-An, Kayin State, community members highlighted overharvesting as a growing concern, with demand outstripping local supply (see more in FGD Report in Chapter 4).
- **Sand and gravel**: The unregulated extraction of sand and gravel for construction can lead to significant ecological degradation. Overextraction from riverbeds and coastal areas can result in erosion, degradation of water ecosystems, and disruption of natural hydrological processes, ultimately impacting local communities' resilience to flooding and other climate-related challenges.
- **Water resources**: Water is vital for shelter construction (for making concrete or other materials) and for sustaining livelihoods within settlements. However, water scarcity is a growing issue in parts of Myanmar, especially during the dry season and in areas where natural water sources are overused or polluted. Construction activities that overburden local

water resources can exacerbate this problem. Moreover, the establishment of settlements near rivers, lakes, or wetlands can degrade water quality due to pollution from waste and untreated sewage, adversely affecting both human populations and aquatic ecosystems. During FGDs carried by Cluster partners, discussions in Namati Lambraw Yang Camp, Kachin State revealed that wells now require drilling over 30 meters deep, compared to less than 15 meters a decade ago, signaling a rapid decline in accessible water sources (see more in FGD Report in Chapter 4).

- **Land clearing and habitat disruption:** Large-scale land clearing for new settlements often results in soil erosion, loss of vegetation, and habitat fragmentation. This disruption can diminish local wildlife populations and reduce the capacity of ecosystems to provide essential services like water filtration and flood control.

Shelter practitioners should be mindful of these resource constraints and prioritize sustainable practices, such as:

- Reducing the reliance on timber by using alternative materials like bamboo (sustainably harvested). (more in Chapter 5)
- Implementing energy-efficient designs to reduce the need for firewood. (more in Chapter 8)
- Regulating the extraction of natural materials like sand and gravel. (more in Chapter 5)
- Ensuring that construction activities do not negatively impact local water supplies.

3. **Climate vulnerability**: Rapid population growth and economic dependence on climate-sensitive sectors like agriculture heighten the risks associated with climate change. The increasing frequency and intensity of extreme weather events threaten food security and livelihoods.

4. **Conflict crisis**: Ongoing conflict and instability disrupt access to resources, displace communities, and strain humanitarian responses. This crisis complicates aid delivery and places additional pressure on already fragile environmental systems.

Impacts on shelter and settlements

- **Destruction of housing:** Severe weather events lead to the widespread destruction of homes, displacing thousands of families and leaving them without safe, secure and dignified shelter. Inadequate housing in the aftermath of such disasters exposes displaced populations to significant health risks, including the spread of diseases due to poor sanitation and overcrowding. This lack of access to safe shelter also increases protection risks, particularly for women, children, and vulnerable groups, who are more susceptible to gender-based violence (GBV) and exploitation in insecure living conditions. FGDs in Rakhine State after Cyclone Mocha recounted entire villages reduced to rubble, with inadequate resources to rebuild safely (see more in FGD Report in Chapter 4).

- **Displacement and humanitarian needs:** Cyclones and floods not only displace entire communities but also create immediate and long-term humanitarian needs. The sudden displacement due to severe weather increases the demand for emergency shelter, food, water, and healthcare, putting a strain on already limited resources. The resulting overcrowded shelters further escalate health and safety concerns. In Magway, FGDs participants described how overcrowded shelters lacked proper sanitation, increasing disease risks, particularly for children and vulnerable groups (see more in FGD Report in Chapter 4).

- **Infrastructure damage:** The destruction of infrastructure, such as roads, bridges, and utility systems, caused by extreme weather events severely limits access to essential services and slows recovery efforts. Damaged transport routes prevent the timely delivery of aid, while broken utility lines disrupt access to clean water, electricity, and healthcare, leaving displaced populations even more vulnerable.

- **Environmental degradation:** In the urgency to provide shelter, rapid solutions often involve unsustainable practices, such as the clearing of land for temporary housing or over-reliance on local resources like timber. This can worsen deforestation, soil erosion, and the destruction of natural barriers, such as mangroves, which are critical for protecting coastal areas from future storms. This environmental degradation not only harms the ecosystem but also creates a cycle of vulnerability, making affected areas more prone to future disasters and further exacerbating the humanitarian crisis.

- **Access to building materials:** Natural disasters often disrupt supply chains, leading to shortages of building resources like timber and bamboo. Furthermore, unsustainable extraction of these materials, driven by the immediate need for shelter, can lead to deforestation and habitat loss, exacerbating environmental challenges. In post-disaster settings, these shortages drive up the cost of building materials, forcing humanitarian organizations to seek alternative, often less sustainable materials. This reinforces the need for innovative and sustainable construction techniques that minimize environmental impact while providing durable, long-term shelter solutions. Without careful planning and sourcing, shelter construction risks contributing further to environmental degradation and reducing the resilience of affected communities. During FGDs in Kayin, community member highlighted the increasing material costs, with bamboo prices doubling within six months of Cyclone Mocha (see more in FGD Report in Chapter 4).

- **Access to land:** Disasters often lead to increased competition for land, especially in areas where land tenure is unclear or disputed. In Myanmar, this issue is particularly challenging due to pre-existing conflicts and overlapping claims to land, especially in areas affected by armed conflict and displacement. Land disputes can delay the implementation of shelter programs, creating tensions between displaced communities, local population, and authorities. It is recommended that humanitarian organizations navigate these legal complexities carefully, working closely with local stakeholders to resolve disputes and ensure that land allocation is fair and conflict-sensitive. Securing

access to land is critical not only for the success of shelter programs but also for promoting long-term stability and resilience in disaster-affected areas. During FGDs in Kachin State, community members highlighted tensions over land rights in resettlement areas, delaying shelter projects and creating additional stress for displaced populations (see more in FGD Report in Chapter 4).

02

ECOSYSTEMS AND PROTECTED AREAS

Myanmar is one of the most ecologically diverse countries in Southeast Asia, home to rich ecosystems that support an array of wildlife, including many endemic and endangered species. Covering approximately 14 major ecoregions, these landscapes range from tropical rainforests and subtropical forests to mangrove swamps and freshwater ecosystems. The ecological health of these areas is crucial for maintaining biodiversity and providing essential ecosystem services, such as clean water, food security, and climate regulation.

However, Myanmar's ecosystems face escalating threats from human activities, including deforestation, agricultural expansion, illegal logging, and unregulated land use. These challenges are further exacerbated by ongoing humanitarian crises, including conflict and natural disasters, which have led to large-scale displacement and the establishment of temporary shelters and settlements. Shelter and settlement projects, while essential for humanitarian response, can strain already fragile ecosystems, particularly when located in or near protected areas.

To mitigate these impacts, it is vital that shelter interventions integrate environmental considerations into planning and implementation. Where possible, settlements should avoid encroaching on protected areas or regions of high ecological sensitivity. In cases where this is unavoidable, every effort should be made to minimize environmental damage by adopting sustainable construction practices, such as using renewable or recycled materials, conserving local resources, and designing settlements to reduce ecological disruption. By aligning humanitarian needs with environmental stewardship, shelter and settlements programs can contribute to both immediate relief and long-term ecosystem resilience.

Myanmar Protected Areas:
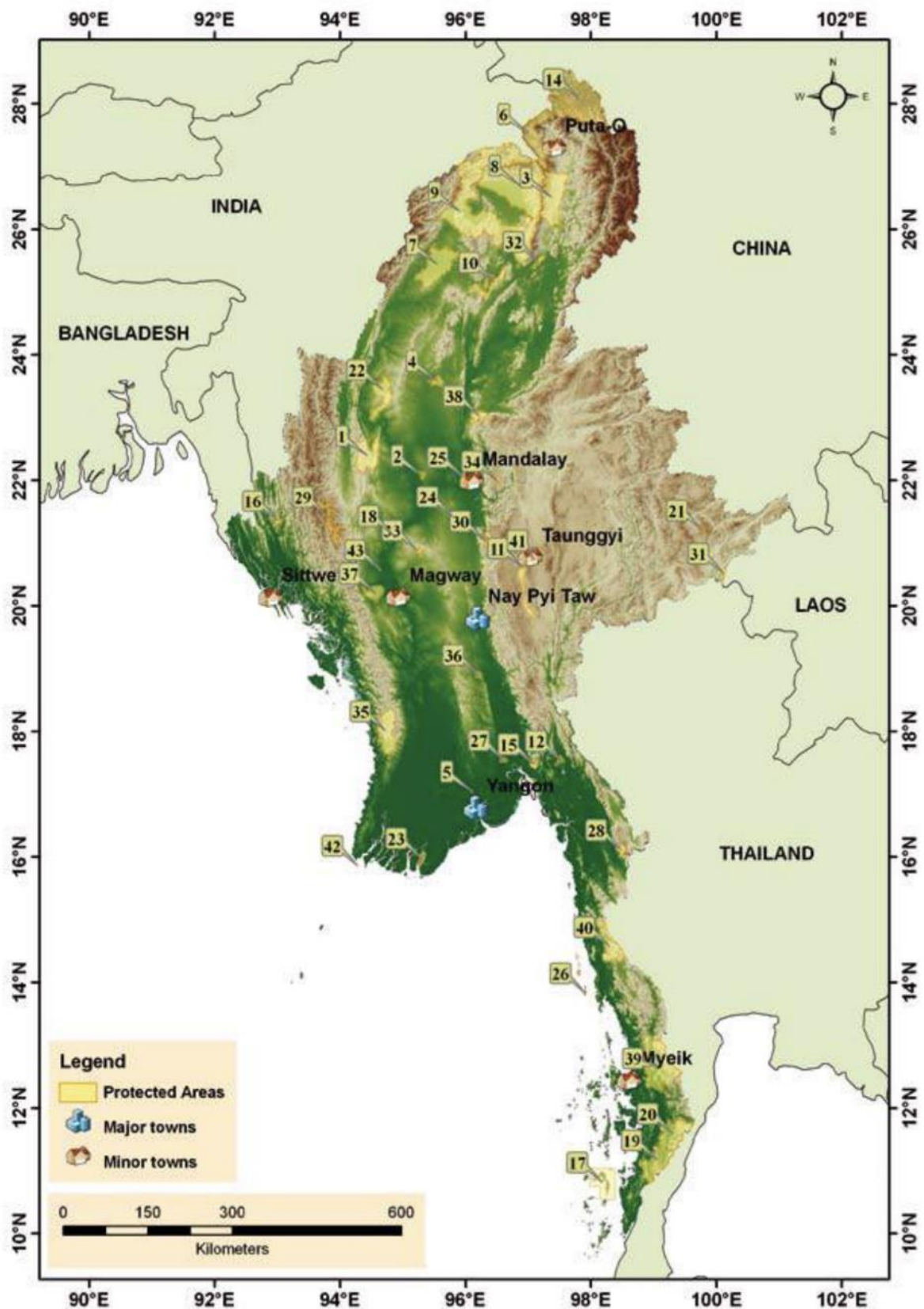
ID	Site name	National Designation	Status	Establishment Year	Area (km2)
1	**Alaungdaw Kathapa**	**National Park**	**Designated**	**1989**	**1597.62**
2	**Bawditataung**	**Nature Reserve**	**Proposed**	**2008**	**72.52**
3	Bumhpabum	Wildlife Sanctuary	Designated	2004	1854.43
4	**Chatthin**	**Wildlife Sanctuary**	**Designated**	**1941**	**269.36**
5	**Hlawga**	**Wildlife Park**	**Designated**	**1989**	**6.24**
6	Hponkanrazi	Wildlife Sanctuary	Designated	2003	2703.95
7	Htamanthi	Wildlife Sanctuary	Designated	1974	2150.73
8	**Hukaung Valley**	**Wildlife Sanctuary**	**Designated**	**2004**	**6371.37**
9	**Hukaung Valley (Extension)**	**Wildlife Sanctuary**	**Designated**	**2004**	**15431.16**
10	**Indawgyi Lake**	**Wildlife Sanctuary**	**Designated**	**2004**	**814.99**
11	**Inlay Lake**	**Wildlife Sanctuary**	**Designated**	**1985**	**641.90**
12	**Kahilu**	**Wildlife Sanctuary**	**Designated**	**1928**	**160.56**
13	**Kelatha**	**Wildlife Sanctuary**	**Designated**	**1942**	**23.93**
14	Khakaborazi	National Park	Designated	1998	3812.46
15	**Kyaikhtiyoe**	**Wildlife Sanctuary**	**Designated**	**2001**	**156.23**
16	Kyauk-Pan-Taung	Wildlife Sanctuary	Proposed	2001	132.61
17	**Lampi Island**	**Marine National Park**	**Designated**	**1996**	**204.84**
18	**Lawkananda**	**Wildlife Sanctuary**	**Designated**	**1995**	**0.47**
19	**Lenya**	**National Park**	**Proposed**	**2002**	**1761.19**
20	**Lenya (Extension)**	**National Park**	**Proposed**	**2004**	**1398.59**
21	**Loimwe**	**Protected Area**	**Designated**	**1996**	**42.84**
22	Maharmyaing	Wildlife Sanctuary	Proposed	2002	1180.39
23	**Mainmahla Kyun**	**Wildlife Sanctuary**	**Designated**	**1993**	**136.69**
24	**Minsontaung**	**Wildlife Sanctuary**	**Designated**	**2001**	**22.60**
25	Minwuntaung	Wildlife Sanctuary	Designated	1972	205.88
26	**Moscos Island**	**Wildlife Sanctuary**	**Designated**	**1927**	**49.19**
27	**Moyingyi Wetland**	**Bird Sanctuary**	**Designated**	**1988**	**103.60**
28	Mulayit	Wildlife Sanctuary	Designated	1936	138.54
29	**Natma Taung**	**National Park**	**Proposed**	**1997**	**722.61**
30	**Panlaung-Pyadalin Cave**	**Wildlife Sanctuary**	**Designated**	**2002**	**333.80**
31	**Parasar (Par Sar)**	**Protected Area**	**Designated**	**1996**	**77.02**
32	**Pidaung**	**Wildlife Sanctuary**	**Designated**	**1918**	**122.08**
33	**Popa**	**Mountain Park**	**Designated**	**1989**	**128.54**
34	Pyin-O-Lwin	Bird Sanctuary	Designated	1918	127.25
35	**Rakhine Yoma Elephant Range**	**Wildlife Reserve**	**Designated**	**2002**	**1755.70**
36	Shinpinkyetthauk	Wildlife Sanctuary	Proposed	2006	71.90
37	**Shwesettaw**	**Wildlife Sanctuary**	**Designated**	**1940**	**552.70**
38	Shwe-U-Daung	Wildlife Sanctuary	Designated	1918	325.95
39	Tanintharyi	National Park	Proposed	2002	2071.81
40	**Tanintharyi**	**Nature Reserve**	**Designated**	**2005**	**1699.99**
41	**Taunggyi**	**Bird Sanctuary**	**Designated**	**1930**	**16.06**
42	Thamihla Kyun	Wildlife Sanctuary	Designated	1970	0.88
43	Wenthtikan	Bird Sanctuary	Designated	1939	4.40

*PAs in bold have been visited by the MEP project staff in the period 2009-2010

Myanmar's endangered ecosystems

1. **Forest ecosystems:**

[Myanmar's forests](), which cover around half of the country, are among its most critical ecosystems. The nation's forests are highly diverse, including tropical rainforests, moist deciduous forests, and subtropical forests. They are home to a vast array of wildlife, including endangered species such as the Myanmar snub-nosed monkey, the Asian elephant, and the Indochinese tiger. Forests also provide vital ecosystem services, such as carbon sequestration, flood control, and the regulation of water cycles.

Despite their importance, Myanmar's forests face significant threats:

- **Deforestation:** Illegal logging, agricultural expansion, and infrastructure development are driving large-scale deforestation. Myanmar has one of the highest rates of forest loss in the world, with logging operations targeting valuable hardwoods like teak.
- **Land use change:** The expansion of agriculture, particularly for rubber, palm oil, and rice cultivation, has led to the conversion of forested areas into agricultural land. This not only reduces forest cover but also fragments habitats, threatening wildlife populations.
- **Fire risk:** Forest fires, often caused by human activities like slash-and-burn agriculture, further degrade forest ecosystems and contribute to biodiversity loss.

2. **Freshwater ecosystems:**

Myanmar is endowed with extensive [freshwater ecosystem](), including rivers, lakes, and [wetlands]() that provide critical habitats for numerous aquatic species and serve as essential water sources for agriculture, fishing, and human consumption. Key freshwater systems include the Ayeyarwady River Basin, which supports much of Myanmar's biodiversity and provides essential resources for millions of people.

Freshwater ecosystems face the following major threats:

- **Water pollution:** Industrial activities, agriculture, and the discharge of untreated sewage and chemicals into rivers and lakes are severely degrading water quality. This pollution affects both human health and the survival of aquatic species.
- **Overfishing:** Unsustainable fishing practices, including the use of destructive gear and overharvesting, are depleting fish populations and disrupting aquatic ecosystems.
- **Dam construction:** Hydropower projects, particularly along major rivers, pose significant risks to freshwater ecosystems by altering water flows, reducing sediment transport, and fragmenting habitats.

Biodiversity in Myanmar

Myanmar is recognized as a global biodiversity hotspot, with over 300 mammal species, 1,000 bird species, and more than 7,000 plant species, many of which are found nowhere else in the world. Despite the access challenges and isolation of some areas in Myanmar, new species continue to be discovered in Myanmar's diverse ecosystems.

However, Myanmar's rich biodiversity is under significant threat. Habitat loss, driven by deforestation, agricultural expansion, and illegal wildlife trade, is putting many species at risk. Poaching of endangered species, including elephants and pangolins, exacerbates this crisis.

Given the rapid loss of biodiversity, raising environmental awareness is crucial. Protecting Myanmar's unique species requires coordinated efforts to conserve their habitats, mitigate the impacts of human activity, and strengthen legal protections against poaching and deforestation.

03

LEGAL FRAMEWORKS/LAWS AND REGULATIONS (INCLUDING HLP)

Myanmar's legal frameworks governing the environment, land use, and resource management are complex, reflecting the country's rich biodiversity, natural wealth, and socio-political challenges. Humanitarian actors working in shelter and settlement projects must navigate these frameworks to ensure environmental sustainability and compliance with national and international standards.

The country's laws aim to protect natural ecosystems, prevent environmental degradation, and support sustainable development, but their implementation faces several challenges, particularly in conflict-affected areas. Legal adherence by humanitarian organizations ensures that projects do not exacerbate environmental damage or harm vulnerable communities.

Key Environmental Laws:

1. **National Environmental Policy (2019)**

The **National Environmental Policy (2019)** underscores the need to integrate environmental considerations into Myanmar's economic and social development processes. It highlights key challenges like deforestation, pollution, and climate change, calling for sustainable management of natural resources to support long-term development goals.

- **Relevance**: Shelter and settlement projects must adhere to this policy by ensuring that they do not contribute to long-term environmental damage. This means prioritizing **sustainable building practices**, protecting natural ecosystems, and ensuring that projects are climate-resilient. The policy also aligns with Myanmar's **Sustainable Development Goals (SDGs)** and its commitment to **multilateral environmental agreements**, such as the **Paris Agreement**.

2. **National Adaptation Programme of Action (NAPA) (2012 and lessons from 2018)**

The NAPA 2012 identified priority areas for adapting to climate change, including agriculture, water resources, and biodiversity, which are closely linked to land and natural resource management. Community-based adaptation and the restoration of degraded ecosystems were emphasized as critical strategies for building climate resilience. The lessons from 2018 showed the need for inclusive governance in land and resource management, highlighting that without local involvement, especially from marginalized groups, environmental and social justice cannot be achieved.

3. **Forest Law (2018)**

Myanmar's **Forest Law (2018)** regulates the sustainable management of forests, addressing **deforestation** and **illegal logging**. Forests are vital for maintaining biodiversity, regulating the climate, and supporting rural livelihoods. Shelter projects often depend on forest resources for materials, making it essential to follow the law's provisions for sustainable sourcing.

- **Relevance:** The law enforces penalties for illegal deforestation and promotes sustainable forestry practices, which are crucial for ensuring that shelter projects do not contribute to further environmental harm. Unsustainable logging could lead to habitat loss and aggravate the climate crisis, which disproportionately affects Myanmar.

4. **Environmental Conservation Law (2012)**

The **Environmental Conservation Law (2012)** serves as the cornerstone of Myanmar's environmental governance. It requires **Environmental Impact Assessments (EIAs)** for development projects, including shelter and settlement initiatives, ensuring that environmental risks are identified and mitigated. These EIAs are critical to preventing activities that could harm local ecosystems, biodiversity, or public health

- **Challenges**: Conducting EIAs in conflict-affected or remote areas is difficult due to weak governance, lack of infrastructure, and limited enforcement. Humanitarian organizations should collaborate closely with local authorities to ensure compliance with EIA regulations and to address any risks related to environmental degradation.

5. **Farmland Law and Vacant, Fallow, and Virgin Lands Management Law (2012)**

These laws govern **land use** and **ownership**, focusing on how agricultural and unclaimed lands can be allocated for various purposes, including housing and settlement. Given the widespread land tenure disputes, especially in conflict-affected regions, these laws are critical for determining who has legal ownership and access to land for shelter projects.

- **Considerations**: Unclear land tenure and overlapping claims pose challenges to humanitarian shelter projects. Disputes between displaced communities, local populations, and the government may delay projects. Humanitarian actors should work closely with local stakeholders to resolve these disputes, navigate legal ambiguities, and avoid exacerbating existing conflicts.

6. [**National Sustainable Development Strategy for Myanmar (2009)**](#)

The NSDS highlights critical environmental challenges driven by population growth and unsustainable land use practices. **These include deforestation from agricultural expansion, illegal logging, and the excessive use of firewood**, all of which contribute to environmental degradation and the depletion of forest resources. The strategy emphasizes the need for sustainable management of natural resources and the **integration of environmental protection into development processes**. This is particularly important for humanitarian shelter projects, which must adhere to sustainable practices to avoid exacerbating deforestation and other environmental harm.

Challenges in legal enforcement and humanitarian response

Although Myanmar has developed comprehensive laws aimed at protecting the environment, weak governance and enforcement remain substantial challenges. In conflict-affected and remote areas, governance institutions lack the capacity to enforce environmental regulations, leaving natural resources vulnerable to exploitation. This presents a complex issue for humanitarian organizations working in these regions.

The military coup in 2021 exacerbated governance challenges, creating competing governance structures between the military junta and opposition forces. Various groups are also asserting control over territory and resources. In this fragmented governance environment, humanitarian actors must be cautious to ensure compliance with legal frameworks while balancing the immediate needs of displaced and vulnerable populations.

At the same time, climate change impacts are intensifying. Myanmar is highly susceptible to extreme weather events such as cyclones, floods, and droughts, and local communities, particularly in rural areas, rely heavily on natural resources for their livelihoods. Humanitarian projects must, therefore, incorporate climate change adaptation and resilience-building measures into their plans, including sustainable resource management, in order to mitigate environmental degradation and support communities.

Housing, Land, and Property (HLP) rights and Environmental Justice

Housing, Land, and Property (HLP) rights are closely linked to governance and environmental challenges in Myanmar, especially in the context of ongoing conflicts and ecological degradation. Many internally displaced persons (IDPs) have lost access to their land due to factors such as conflict, land grabbing, and environmental degradation. Shelter practitioners should be acutely aware of these dynamics, as addressing HLP rights is crucial for promoting social equity and environmental sustainability.

Restoring land to displaced communities is an important aspect of the transition to peace in Myanmar. However, it is essential to approach this restoration with an awareness of the need for balance between reparations, environmental conservation, and economic development. This balance can be complex, requiring careful consideration of the local context.

Inclusive decision-making is critical in land and resource management. Shelter practitioners should include local communities, ethnic minorities, women, and youth when making land management and site allocation decisions. Engaging these groups can lead to more equitable resource distribution and enhance social cohesion.

Land disputes often arise from overlapping claims or unclear land tenure, presenting significant challenges for shelter programming. Shelter practitioners must navigate these disputes with caution, as they can complicate project implementation and lead to tensions among communities. Understanding the local context and engaging with local stakeholders is essential to mitigate these risks.

By being mindful of these challenges related to HLP rights and environmental justice, shelter practitioners can better address the complexities of land management in their programming. Recognizing the interconnections between land rights, environmental health, and community resilience will help foster a more equitable and sustainable approach to shelter interventions in Myanmar.

04

ENVIRONMENTAL ASSESSMENTS

Environmental assessments are crucial in identifying and mitigating the potential impacts of shelter and settlement projects. Given Myanmar's significant environmental challenges and socio-political complexities, it is essential for humanitarian projects to be designed with a comprehensive understanding of local ecological and social dynamics. These assessments ensure that activities are carried out in a way that minimizes harm to the environment, respects local communities, and aligns with sustainable practices.

When discussing environmental assessments in the context of humanitarian interventions, it's important to clarify the distinctions between Environmental Screening, Environmental Impact Assessments (EIAs), and broader Environmental Assessments (EAs).

- **Environmental Screening** is often the initial step in the assessment process, allowing practitioners to identify potential environmental issues associated with a project early on. Tools like [NEAT+](#) (Nexus Environmental Assessment Tool) are useful for this purpose, providing a simplified framework for assessing the environmental implications of shelter and settlement projects in humanitarian contexts. This initial screening helps determine whether a full EIA is necessary and allows organizations to take proactive measures to mitigate environmental impacts.
- **Environmental Impact Assessments (EIAs)** conduct a much more detailed analysis of the environmental impacts of a particular project. They involve a detailed evaluation of how construction, resource use, and human activities related to the project might affect the environment. This process includes identifying potential negative impacts and developing targeted mitigation strategies to minimize them.
- **Environmental Assessments (EAs)** take a broader approach. They assess the overall environmental state and the implications of policies, plans, or programs, rather than focusing on a single project. These assessments aim to inform decision-making at a strategic level, providing a more comprehensive view of environmental concerns within a specific context.

The importance of these assessments is increasingly recognized by donors like DG ECHO, which require all projects they fund to have undergone an environmental screening, such as using NEAT+. DG ECHO

places significant emphasis on integrating environmental considerations into humanitarian interventions, prioritizing funding for projects that demonstrate a clear commitment to environmental sustainability. This ensures that aid efforts do not exacerbate existing environmental issues or create new ones. As such, environmental assessments are not only considered a best practice but also a crucial requirement for securing support from key funding bodies (see more in Chapter 11).

By conducting thorough environmental screenings and impact assessments, practitioners can mitigate potential negative effects on local ecosystems and communities, ultimately supporting more sustainable shelter solutions.

As part of the development of this Environmental Country Profile, cluster partners conducted Focus Group Discussions (FGDs) in key regions of Myanmar, including Rakhine, Magway, Kachin, and Chin. These FGDs aimed to gather local perspectives on environmental challenges related to shelter and displacement, helping practitioners understand the specific ecological issues that affect these communities. Report available in this link.

Environmental Impact Assessments (EIA) and Myanmar's Legal Framework

Myanmar's environmental governance, as explained in Chapter 3, is anchored by the Environmental Conservation Law (2012), which mandates the use of Environmental Impact Assessments (EIAs) for development activities (humanitarian assistance is not specified), including shelter and settlement projects. The Myanmar EIA Procedure (2015) details the requirements for EIAs, incorporating a Strategic Environmental Assessment (SEA) component to evaluate broader environmental impacts at the policy and program levels.

Key principles involved in an Environmental Impact Assessment:

- Screening
- Scoping
- Alternative Analysis
- Impact identification/analysis
- Mitigation and impact management
- Evaluation of significance of residual impact
- Environmental Assessment reporting, along with Mitigation Measures and Management Plan
- Stakeholder consultation and public disclosure
- Decision making
- Monitoring and follow up

Challenges in conducting EAs and EIAs in humanitarian contexts:

Conducting Environmental Assessments (EAs) and Environmental Impact Assessments (EIAs) in humanitarian contexts like Myanmar presents significant challenges, especially in conflict-affected or remote areas. These challenges include:

- **Time constraints**: Humanitarian settings often demand quick action. Comprehensive assessments may be difficult to conduct within the limited timeframe of the initial response phase, where the primary focus is on life-saving interventions.
- **Access issues**: Reaching conflict zones or remote areas can be challenging due to security concerns or logistical constraints, making it difficult to conduct thorough on-the-ground assessments.
- **Competing priorities**: In emergency situations, immediate humanitarian needs such as shelter, food, and medical care often take precedence, and environmental sustainability can be seen as secondary or less urgent.
- **Data and expertise gaps**: Accurate and reliable environmental data is often lacking in these contexts, and there may be limited access to experts in environmental impact assessments. Additionally, consultations with communities or stakeholders may be constrained by time or limited accessibility.

Despite these challenges, environmental assessments are crucial for ensuring that shelter and settlement interventions do not exacerbate existing environmental degradation or create new risks. In Myanmar, where deforestation, land misuse, and other environmental pressures are prevalent, failing to assess and mitigate the impact of humanitarian projects can contribute to long-term environmental harm, affecting both ecosystems and vulnerable communities.

Quick environmental screening tools like NEAT+ can help overcome some of these challenges by offering a more rapid and practical approach to identifying potential environmental impacts. NEAT+ allows practitioners to conduct initial assessments more efficiently, even when facing time constraints or limited access to expert resources. This tool helps ensure that key environmental risks are considered early in the project cycle, guiding shelter and settlement decisions in a way that integrates sustainability with urgent humanitarian needs.

By using tools like NEAT+, humanitarian organizations can balance immediate response efforts with longer-term environmental considerations, ensuring that interventions are both effective and sustainable. Additionally, close collaboration with local authorities and communities can enhance the reliability of these assessments, even in challenging contexts.

Key tools and resources to assist conducting environmental assessments

Several tools assist humanitarian organizations in conducting environmental assessments, especially in challenging environments like Myanmar:

- **NEAT+ (Nexus Environmental Assessment Tool)**: A rapid environmental assessment tool designed to quickly identify environmental risks associated with humanitarian activities, particularly in key sectors like shelter, water, sanitation, and waste management. By facilitating fast, on-site evaluations, NEAT+ ensures that humanitarian interventions in crisis settings are both environmentally responsible and sustainable, helping mitigate any negative impacts on the local ecosystem.

  In Myanmar, NRC is training its staff in the use of NEAT+ and is also planning to build in-country capacity that can benefit other humanitarian organizations. This expertise allows NRC to support the wider humanitarian community, including Cluster partners, in integrating environmental considerations into their programs. By collaborating with NRC, Cluster partners can leverage this capacity to better assess environmental risks, ensuring that their interventions align with environmental best practices.

- **Rapid Environmental Assessment (REA)**: Designed to be used during the critical disaster response period (typically within 120 days after a disaster impact). The REA identifies immediate environmental factors relevant to relief operations and provides data for incorporation into the EIA process and long-term recovery efforts. It offers a snapshot of environmental conditions and anticipates impacts, filling the gap between disaster onset and formal EIA initiation. Pre-disaster preparation, such as staff training and data collection, can expedite the REA process.

- **Environmental Impact Assessment tools and techniques (WWF GRRT)**: Training module on integrating environmental considerations into project planning.

- **PASSA (Participatory Approach for Safe Shelter Awareness)**: PASSA enhances environmental assessments by involving communities in shelter design and construction. This approach integrates local knowledge and sustainable practices, promoting eco-friendly solutions in rural Myanmar. PASSA helps identify environmental risks while fostering community ownership and resilience, ensuring shelter projects align with both local needs and environmental sustainability.

- **Green Response: Environmental Quick Guide (IFRC)**: While this is not a direct assessment tool, the Quick Guide provides actionable recommendations for conducting environmental assessments, making it a valuable companion in the early stages of project planning. It highlights general principles of sustainability, such as resource efficiency, eco-friendly materials, and reducing waste, which can be applied across various humanitarian interventions.

05

GREEN SHELTER BUILDING PRACTICES AND MATERIALS

Green shelter building practices are essential in [Myanmar's humanitarian response to ongoing insecurity crises and frequent natural disasters](). As displacement continues and communities endure recurring climate hazards, there is an urgent need for sustainable and durable shelter solutions that minimize environmental impact and enhance community resilience. Emergency shelters in IDP sites and reconstruction efforts in disaster-affected areas should incorporate eco-friendly practices and durable materials to ensure long-term sustainability. This chapter explores strategies for integrating greener building techniques and increasing the lifespan of shelter materials through innovative approaches.

Sustainable materials and techniques for shelter in Myanmar

Sustainable construction materials and Myanmar's rich natural resources, such as bamboo, offer promising solutions for humanitarian shelter interventions if their value is recognized and harnessed. Additionally, integrating recycled, renewable, and low-impact materials into shelter projects can help mitigate the adverse effects of deforestation and resource depletion while fostering community participation and ownership.

Bamboo as a key resource:

Bamboo has long been a traditional material in Myanmar, widely used by local communities for housing, furniture, and tools. As an abundant and highly renewable resource, bamboo grows quickly and replenishes itself much faster than timber. This makes it a sustainable alternative to conventional construction materials, especially in a country where deforestation poses significant environmental challenges. In humanitarian contexts, bamboo can be employed for structural elements, cladding, thatching, and flooring, significantly reducing the environmental footprint of shelter construction.

Despite its traditional use, bamboo's full potential in modern, resilient construction has not always been fully recognized by communities. However, humanitarian partners in the Shelter/NFI Cluster have pioneered [innovative solutions using bamboo, demonstrating its strength, flexibility, and suitability for]()

disaster-resistant shelter designs. These initiatives highlight bamboo's role as a low-cost and sustainable material and as a solution that can reduce environmental degradation while supporting local livelihoods.

To maximize the lifespan of bamboo, it is essential to implement proper harvesting practices, ensuring that only mature bamboo is utilized. The ideal approach combines this proper harvesting with treatment using borax and boric acid, which are recognized by the International Network for Bamboo and Rattan (INBAR) as effective methods for preserving bamboo. While these treatments involve chemicals, they are not harmful to the environment if disposed of properly. It is important to note that other chemical treatments may be banned or controlled by donors, but borax and boric acid are accepted and recognized as international standards by INBAR.

Preschool in Hmawbi
©Housing NOW | Raphaël Ascoli

Traditional treatment techniques also play a crucial role in bamboo preservation. For example, in Myanmar, in rural mountain areas, bamboo is often transported via rivers, which naturally treats the material, enhancing its resistance to insects by the time it reaches its destination. This sustainable and cost-effective water treatment method does not require the addition of chemicals.

Currently, Myanmar lacks large-scale bamboo treatment stations. However, this gap presents an opportunity for humanitarian shelter practitioners to promote the establishment of such facilities. Developing treatment stations could increase the lifespan of bamboo used in construction and also create new income-generating activities for local communities. By drawing inspiration from the successful bamboo treatment station in Cox's Bazar, Bangladesh, for the Rohingya Crisis, which has effectively addressed similar challenges, stakeholders in Myanmar could implement sustainable solutions that benefit the environment and support community livelihoods.

Bamboo treatment station in Cox's Bazar, Bangladesh
© Nate Webb

Recycled and repurposed materials:

Using recycled or repurposed materials, such as reclaimed wood or construction debris, offers a sustainable and cost-effective solution for shelter construction. This approach reduces reliance on raw materials, supports a circular economy, and mitigates environmental degradation. In Myanmar, where environmental challenges intersect with economic constraints, these practices are particularly relevant. They help combat deforestation, enhance resource efficiency, and provide practical, low-cost alternatives to conventional building materials. Reclaimed materials can be salvaged from disaster-damaged buildings or sourced from construction waste, extending their lifecycle and reducing environmental impact. Innovative uses of recycled materials in Myanmar include incorporating glass bottles into mud walls, which improve insulation and add aesthetic value.

Inle Heritage Private School
© IFRC | Nadia Khoury

Tires have already been reused in other activities in Myanmar and have the potential to also be used for construction purposes, such as retaining walls or foundational structures.

Repurposing activities from Youth Program
© MRCS/IFRC Myanmar

Earthship retaining wall construction
© Earthship

Globally, combining reclaimed materials with local techniques has proven to be an effective way to create resilient, affordable, and environmentally conscious shelters.

Low-impact construction techniques:

In Myanmar's tropical climate, adopting energy-efficient shelter designs can make a significant difference in both environmental impact and quality of life. By utilizing innovative construction techniques that prioritize sustainability, resilience, and local materials, communities can create shelters that are both environmentally friendly and comfortable for the users. These approaches minimize the ecological footprint of humanitarian operations and empower local communities by utilizing locally sourced materials and traditional construction methods.

One notable example from Myanmar is the Inle Heritage Private School, which combines bamboo, mud bricks, and recycled materials like glass bottles. This technique leverages the lightweight and renewable properties of bamboo, alongside the thermal mass of mud bricks, to enhance indoor comfort. The use of recycled glass bottles further reduces waste while providing additional insulation and colourful natural lighting. Furthermore, incorporating passive design strategies, such as optimizing natural ventilation and strategically placing windows for daylight, significantly reduces energy consumption.

Inle Heritage Private School
© IFRC | Nadia Khoury

Encouraging the proper use of sustainable materials:

While bamboo and other sustainable materials have great potential, proper training and technical support are required to ensure these materials are used effectively. For example, communities should be made aware of the environmental and economic benefits of using bamboo and other resources over timber,

and humanitarian organizations should provide the technical knowledge required for sustainable material harvesting and processing practices, as well as for durable and disaster-resistant shelter design and construction.

Construction materials commonly used in Myanmar and their environmental impact, benefits and considerations

Material	Accessibility	Cost	Environmental Impact	Durability	Strategic use
Bamboo	❧❧❧❧❧ (abundant)	❧❧❧❧ (affordable)	❧❧❧❧❧ (low - highly renewable, fast-growing, absorbs carbon dioxide, and requires minimal processing, but transportation and chemical treatments can increase its impact)	❧❧❧❧❧ (durable w/ treatment and preventive design)	Ideal for structural framing and cladding, combined with thatch or recycled materials for roofing and insulation.
Timber	❧❧❧❧❧ (common)	❧❧❧❧❧ (moderate)	❧❧❧❧ (moderate - renewable when sustainably sourced, but unsustainable logging and long-distance transportation raise its carbon footprint)	❧❧❧❧❧ (durable w/ treatment)	Ideal for structural framing or furniture, combined with bamboo for reduced environmental impact
Recycled wood	❧❧❧ (limited)	❧❧❧ (low)	❧❧❧❧❧❧ (low - reduces waste and demand for new timber, with minimal processing and carbon emissions, especially when sourced locally)	❧❧❧❧ (depending on quality)	Suitable for interior elements, and structural framing combined with timber and bamboo.
Clay/earth bricks	❧❧❧❧❧ (locally available)	❧❧❧ (low)	❧❧❧❧❧ (low - made from natural, local materials with little processing. Sun-dried bricks are especially low-impact, requiring no firing energy)	❧❧❧❧❧❧ (durable w/ preventive design)	Effective in walls and foundations. Can be combined with bamboo structure and thatched roofing.
Thatch/palm leaves	❧❧❧❧❧ (locally availab	❧❧❧ (low)	❧❧❧❧❧❧ (low - locally sourced, biodegradable, and minimally processed, reducing overall	❧❧❧ (low)	Suitable for roofing or wall covering.

			environmental impact)		
CGI sheets	❧❧❧❧ (widely available)	❧❧❧❧ (moderate)	❧❧ (high - energy-intensive metal extraction and galvanization processes contribute significantly to greenhouse gas emissions)	❧❧❧❧❧ (durable)	Suitable for roofing. Can be combined with thatched bamboo/palm leaves to increase thermal comfort.
Plastic sheeting	❧❧❧❧❧ (easily available in emergencies)	❧❧❧ (low)	❧ (very high - fossil fuel-derived, non-biodegradable, with high production emissions and a short lifecycle leading to increased waste)	❧❧ (low)	Used primarily for temporary shelters. Can be combined with thatched bamboo/palm leaves to increase its lifespan.
Concrete	❧❧❧❧ (widely available)	❧❧❧❧❧❧ (high)	❧ (very high - cement production is a major source of CO_2 emissions, with high energy and raw material demands)	❧❧❧❧❧ (durable)	Best used for foundations (permanent). Can be combined with bamboo for lighter structures.
Debris	❧❧❧ (limited - depending on location)	❧❧ (low)	❧❧❧❧❧❧ (low - Reusing debris reduces landfill waste and the need for new materials, making it environmentally sustainable when handled properly)	❧❧❧❧❧ (depending on material)	Can be reused in reconstruction for rubble foundations or recycled wood for frames and furniture, reducing waste and lowering reconstruction costs

During FGDs carried by Cluster partners, community members from specific communities shared more information about the most common construction materials used in Myanmar. See the compiled report here.

Increasing the lifespan of shelter materials

One of the significant challenges in humanitarian shelter interventions is the limited lifespan of shelter materials, particularly in environments prone to harsh weather. Emergency materials, such as plastic sheeting, degrade quickly, leading to frequent replacements, which strains logistics, increases costs, and adds to environmental waste. Implementing effective strategies for extending the durability of shelter materials is crucial in addressing these issues and ensuring long-lasting, resilient shelters.

1. **Material protection and treatment:**

- Plastic sheeting**:** One of the most commonly used materials in emergency shelter construction but typically only lasts between 3 to 6 months, especially in harsh climates like Myanmar. However, the durability of plastic sheeting can be significantly increased with proper installation and protective techniques. Covering the plastic with bamboo thatch, grass, or other natural materials provides insulation and protection from direct exposure to the elements, extending its lifespan to 12 to 18 months. These methods reduce UV degradation and limit damage from heavy rainfall, making them highly valuable in environments with intense sun and seasonal rains.
- Treatment of bamboo and wood: Treating bamboo and wood with natural preservatives can extend their lifespan and increase resistance to pests and weathering. Simple methods, such as soaking bamboo in saltwater or treating wood with natural oils, have proven effective in increasing durability, ensuring that shelter structures can withstand environmental conditions for a longer period.
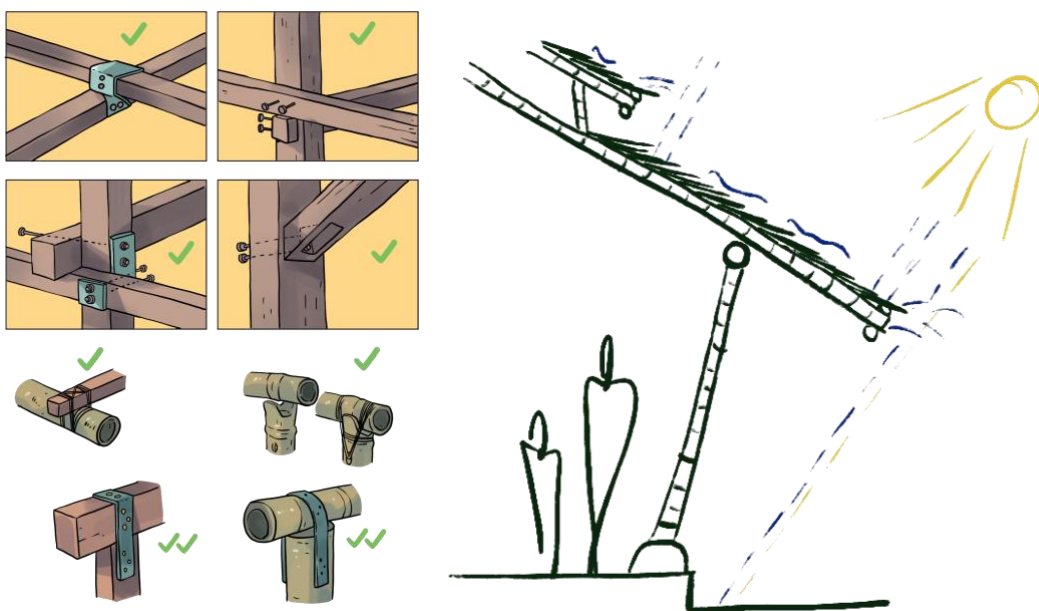
2. **Preventive design principles for safer shelters:**
- Elevated structures in flood-prone areas: In regions prone to flooding, elevating shelters on stilts or raised platforms is an effective preventive design strategy. By keeping the structure above floodwaters, this approach protects both the shelter and its materials, minimizing damage and reducing the need for frequent repairs or replacements. Elevated designs are particularly important in Myanmar's delta and lowland areas, susceptible to seasonal flooding.

Safe Shelter Awareness Key Messages, 2024 Booklet © IFRC and MRCS

- <u>Durability enhancements through design:</u> Incorporating specific design elements can significantly enhance the resilience of shelters. For example, using double layers of bamboo or thatch on roofs and walls increases the structure's insulation and resistance to wear. Reinforcing high-stress areas, such as corners and roof joints, prevents premature damage. Orienting the shelters away from prevailing winds and strategically placing them to avoid direct exposure to sun and rain further improves the durability of materials. Adequate roof design, with overhangs for sun and rain protection, is another simple yet effective method to prolong the lifespan of both the shelter and the materials used.

Safe Shelter Awareness Key Messages, and preventive design principles
© IFRC and MRCS | Eva Samalea

Green shelter practices in humanitarian interventions

In Myanmar, the dual crises of insecurity and natural disasters place immense pressure on the humanitarian response, particularly in providing adequate and environmentally sustainable shelters. Green shelter practices can address these challenges by:

1. **Emergency shelters in IDP sites:**
- Emergency shelters in IDP sites should be designed to provide immediate protection and to minimize environmental damage. Using locally sourced materials like bamboo and implementing protective designs to extend the lifespan of plastic sheeting and other materials is critical in IDP sites. Such innovations can reduce the need for frequent replacements, lowering environmental impacts and logistical costs.
- Participatory approaches: Engaging communities in shelter design and construction through approaches like PASSA (Participatory Approach for Safe Shelter Awareness) ensures that shelters

meet local needs and foster a sense of ownership. Community-led approaches that involve community members in the design and implementation process also enhance local skills, build resilience, and ensure shelters are maintained and adapted over time.

2. **Post-Disaster reconstruction:**

- Build Back Better: In areas affected by natural disasters, reconstruction efforts should prioritize green building materials and techniques, incorporating bamboo, earth, or other renewable resources. Energy-efficient designs, combined with preventive measures such as reinforced foundations and elevated structures, can increase the resilience of rebuilt homes to future environmental hazards.
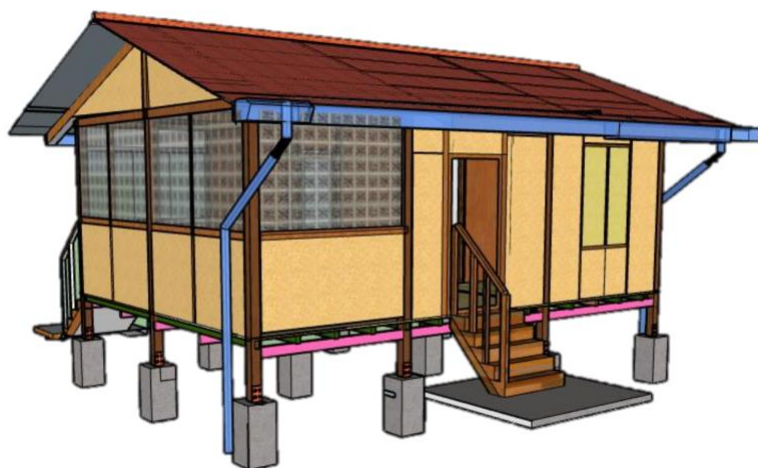
Transitional shelter design for Magway and Sagaing
© Solidarités International and UNHCR

- Site planning for resilience: Linking reconstruction activities with broader site planning (as detailed in Chapter 6) is critical for creating settlements that are resilient to future disasters and also designed in harmony with the environment.

Community-led approaches towards community resilience

1. **Community ownership in shelter design:**

Community involvement in shelter design is critical for fostering ownership and long-term sustainability. By using participatory methods communities are engaged in the construction of their shelters and also empowered to make informed decisions that reflect their local needs, environmental conditions, and cultural practices. This collaborative process encourages community members to incorporate local knowledge, such as the use of bamboo and traditional thatching techniques, ensuring that shelters are resilient to local climate conditions and culturally appropriate.

Tools like FGDs also enhance community ownership and engagement. As part of the development of this Environmental Country Profile, some Cluster partners carried FGDs in specific communities, and major findings are in this compiled report.

By actively engaging in the design process, communities can integrate locally sourced materials, particularly sustainable resources into the construction of their homes. This approach reduces reliance on imported materials and also strengthens local economies. Furthermore, it enhances the community's ability to maintain and repair their shelters, promoting long-term resilience and reducing future dependency on external aid.

Some shelter partners in Myanmar are providing training for participatory methods in their interventions with valuable lessons for shelter actors including:

- Community-Led Settlement processes by CRS and KMSS
- PASSA by IFRC and MRCS

2. **Cash-Based Interventions for community resilience:**

Cash-Based Interventions (CBI) offer an adaptable and effective way to meet community needs in humanitarian settings, promoting resilience by giving households autonomy in how they address their shelter needs. In Myanmar, the Myanmar Shelter Cluster has developed specific guidelines for using CBIs in shelter interventions, distinguishing them from Multipurpose Cash Assistance (MPCA), which can cause confusion during implementation. The guidelines help to navigate the complexities of the local market and maximise the effectiveness of CBI in this context.

Using CBIs for shelter in Myanmar presents unique challenges, and it is important to be aware of the interconnections between cash, shelter, and environmental impacts to ensure sustainability. Some key considerations include:

● Market access and material availability: One of the biggest challenges for implementing CBIs in Myanmar is limited market access. Conflict, transportation disruptions, and geographic isolation can make it difficult for communities to access the materials needed for shelter construction. Even in regions with functioning markets, the availability of essential materials, such as bamboo and timber, can be inconsistent, with prices frequently fluctuating due to inflation or logistical issues.

Proper market assessments are crucial to understanding local availability, but these assessments can be difficult to conduct due to the volatile nature of markets in conflict-affected or remote areas. A lack of materials or fluctuating prices can significantly impact the effectiveness of cash-based programs if households cannot reliably source what they need within their budget.

- Environmental impacts of Cash-Based Interventions: CBIs in Myanmar can be aligned with environmentally conscious practices, which will support the resilience of the community and the environment. For instance, organizations can promote the use of sustainable, locally available materials like bamboo or recycled components. Cash can also be linked to incentivizing sustainable practices, such as rewarding households that build shelters following environmental guidelines, using renewable materials, or incorporating traditional construction methods that enhance resilience.

  However CBIs can also lead to negative environmental impacts if not properly managed. For example, if demand for timber spikes due to a CBI, it could lead to over-harvesting, deforestation, or habitat destruction, particularly in regions where these resources are already under strain. To mitigate these risks, organizations should encourage the use of replenishable materials, such as sustainably sourced bamboo, and provide education on best practices for sustainable construction.

By strategically linking cash-based interventions with environmentally sustainable practices, humanitarian organizations can promote long-term resilience both for communities and the environment. Organizations should be vigilant in promoting environmentally sound construction techniques and materials, ensuring that cash assistance meets immediate shelter needs but without negative environmental impacts.

3. **Capacity building and training:**

Building the capacity of communities to design, construct, and maintain their own shelters is a fundamental component of resilience as a green building practice. Through training programs and community workshops, humanitarian organizations can equip local builders, community leaders, and affected populations with the knowledge and skills necessary to adopt sustainable building practices. This capacity-building process strengthens the community's ability to manage future shelter needs, reduces dependency on external assistance, and promotes the use of environmentally friendly construction techniques (more about Capacity Development in Chapter 10)

Key focus areas for capacity building include:

- Sustainable construction techniques: Training local builders in the use of bamboo treatment and green construction methods ensures that communities can build durable, long-lasting shelters that minimize environmental impacts. Proper treatment of bamboo, for example, can significantly enhance its durability, making it a viable long-term alternative to traditional timber. (Currently, some Cluster partners are developing a bamboo processing and construction manual, and it will be included here as soon as it is available.)
- Energy-efficient design principles: Capacity-building efforts can promote passive cooling, natural ventilation, and solar shading techniques in shelter design, which reduce the need for energy-intensive cooling systems. This is particularly important in Myanmar's tropical climate, with high temperatures and limited energy resources.

- Disaster Risk Reduction: Equipping communities with knowledge about preventive design principles, such as elevating shelters in flood-prone areas or reinforcing structures to withstand high winds, can significantly enhance resilience to natural disasters.

Training programs should also focus on empowering communities to manage waste during the construction process, ensuring efficient use of materials and minimizing environmental impacts.

06

GREEN SITE PLANNING FOR RESILIENT SETTLEMENTS

Strategic site planning is essential to create resilient and sustainable settlements that address environmental and socio-cultural challenges. In Myanmar, where climate change and ongoing insecurity increase the vulnerability of displaced and disaster-affected communities, careful planning can significantly reduce exposure to hazards like floods, fires, landslides, and cyclones. By using the Settlements Approach, which involves identifying and delineating an "area of intervention" based on both physical and socio-cultural boundaries, humanitarian actors can integrate environmental considerations from the outset to improve the quality of life and reduce risks for the affected populations.

Integrating environmental criteria early ensures that essential natural features and resources that support community resilience are protected, from water sources and vegetation to soil quality. Likewise, considering factors like climate change projections and environmental risks adds depth to site selection. These decisions influence shelter sustainability, access to essential resources, and the population's resilience against hazards. Local knowledge about natural resources and usage patterns is also invaluable, complementing formal land-use data and creating a well-rounded understanding of the environment's role in site planning.

Humanitarian organizations involved in shelter and Camp Coordination and Camp Management (CCCM) are particularly critical in this effort. By promoting community involvement in planning, assessing sites for climate resilience, and implementing disaster risk reduction (DRR) strategies, organizations can help mitigate the environmental impacts of settlements. Approaches like flood management, natural buffer zones, and sustainable practices in water use and waste management enhance resilience to both natural and human-made challenges, ensuring that communities are better equipped to adapt and thrive in their environments.

Site planning principles for resilience

Resilient site planning involves making informed decisions about where and how to establish settlements.

Key principles include:

1. **Geographical stability:** Site selection should minimize the risk of natural hazards such as floods and landslides. Areas prone to frequent natural disasters should be avoided when possible, with mitigation measures in place where risks are unavoidable.
2. **Access to essential services:** Sites must be established considering access to essential services, including clean water, food, healthcare, education and protection. This ensures that communities are not only safe but also supported in terms of their long-term well-being.
3. **Environmental sensitivity:** Sites should avoid ecologically sensitive areas, such as wetlands or protected forests, to prevent further environmental degradation. Sustainable land-use practices should be promoted to balance community needs with environmental conservation.

Addressing environmental concerns through the Settlements Approach
© IMPACT

Drainage systems and flood management

Flood management is critical in Myanmar, particularly during the monsoon season. Proper drainage systems are essential for protecting settlements from heavy rain, reducing flood risks, and preventing waterborne diseases.

Government-led flood management infrastructure in Magway © IFRC

Key considerations for the establishment of proper drainage systems are:

1. **Main drainages:** Primary drainage systems in settlements must be designed to handle significant rainfall. These systems direct water away from key infrastructure, preventing widespread flooding and protecting the health and safety of the community.
2. **Secondary drainages:** Secondary drainage channels serve as intermediate channels, carrying water to the larger main drainage and reducing pressure on it during heavy rains. Proper planning and construction of secondary drainages are essential for ensuring that water is effectively channelled throughout the settlement
3. **Tertiary drainages:** In addition to main and secondary drainages, individual shelters must have access to tertiary drainage systems to handle localized water buildup around homes. These smaller drains, easily maintained by shelter owners with technical guidance, ensure that rainwater is directed safely away from shelters, reducing the risk of flooding, waterlogging, and erosion.
4. **Community involvement in drainage maintenance:** Community participation is key to the success of drainage systems. Shelter owners should receive training and technical advice on maintaining both secondary and tertiary drainage systems, empowering them to take responsibility for their own shelter environments. Clear messaging and technical support ensure that the community understands the importance of proper drainage and flood management.
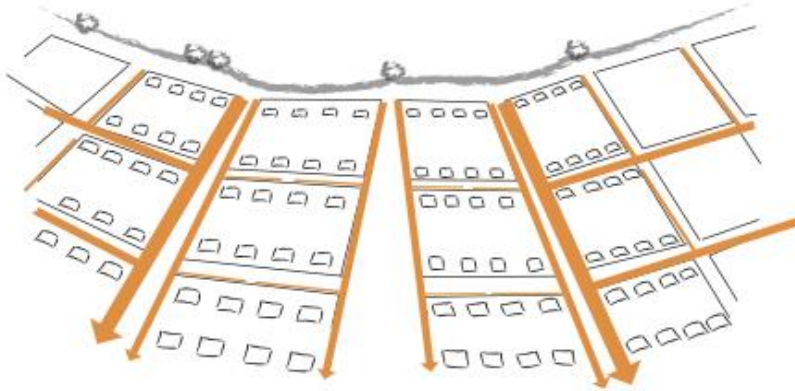
Drainages | Site Planning - Guidance to reduce the risk of GBV
© IOM for Global Shelter Cluster

Disaster Risk Reduction (DRR) measures

In humanitarian responses, providing emergency and transitional shelter and non-food items is essential not only for immediate relief but also as part of longer-term Disaster Risk Reduction (DRR) strategies. When shelter operations are planned and implemented with a focus on resilience and a "Build Back Better and Safer" philosophy, they provide an opportunity to reduce existing risks and help communities recover stronger and more securely. However, without careful planning, shelter and settlement projects can inadvertently exacerbate risks, increasing vulnerabilities to future disasters.

A well-rounded DRR approach in shelter planning involves proactive and preventive strategies that help mitigate hazards specific to each environment, while also preparing communities for sustainable rebuilding. For example:

1. **Elevated structures:** In flood-prone regions, shelters should be built on raised platforms or stilts to protect them from floodwaters. This preventive measure significantly reduces the risk of water damage to both the shelter and its contents (to be complemented with a tertiary drainage system).
2. **Firebreaks and safe distances:** In overcrowded settlements, the risk of fire can be significant. Designing firebreaks and ensuring safe distances between shelters can help reduce the spread of fire. Additionally, using non-combustible materials for construction and promoting fire safety practices within the community are essential.
3. **Early warning systems:** In disaster-prone areas, establishing early warning systems is crucial for protecting communities from extreme weather events. These systems should include communication channels for issuing alerts and evacuation plans that are understood and accessible to all community members.

To build resilience effectively, DRR measures must be integrated across all stages of humanitarian shelter programs, from initial site planning through multi-year planning and engagement with the community.

This involves aligning with frameworks like the [Humanitarian Programme Cycle (HPC)](#), Humanitarian Needs and Response Plans (HNRP), and Shelter Cluster Strategies. By ensuring community engagement and drawing on local knowledge, shelter initiatives can achieve greater acceptance and effectiveness, helping affected populations gain ownership of the recovery process and enhance the community's preparedness against future hazards.

Community engagement and ownership

Community participation is essential in all phases of site planning and settlement design. By involving local populations in decision-making processes, humanitarian actors can ensure that the solutions are culturally appropriate, meet the needs of the affected populations, and foster long-term sustainability.

1. **Community-led approaches:** Engaging communities in planning ensures that their needs and local knowledge are incorporated into settlement and infrastructure design. This promotes ownership and encourages residents to take an active role in maintaining critical infrastructure, such as drainage systems and shelter designs.
2. **Capacity building:** Providing training on DRR, basic construction techniques, and maintenance of infrastructure empowers residents to manage their settlements more effectively. Capacity-building initiatives not only enhance community resilience but also ensure that infrastructure is maintained and improved over time.

07

GREENER NON-FOOD ITEMS

The distribution and use of Non-Food Items (NFIs) in Myanmar's humanitarian responses are critical but can have significant environmental implications. Many NFIs, such as plastic sheeting and household items, have environmental impacts, particularly due to plastic waste. Additionally, the packaging used for these items often consists of non-biodegradable plastics that add to the waste burden and pollution, especially in areas lacking adequate waste management infrastructure. The volume of packaging material can be substantial, making it essential for humanitarian organizations to consider sustainable alternatives and reduce the amount of packaging on NFIs. By linking the management of NFIs with the guiding principles of the Shelter/NFI/CCCM Cluster's Environmental Action Plan (EAP), organizations can mitigate environmental impacts while still meeting humanitarian needs.

Prioritizing eco-friendly packaging (ideally local), reusable materials, and waste reduction strategies can play a key role in minimizing harm to the environment, reducing waste, and promoting more sustainable humanitarian interventions.

EXAMPLE: In Myanmar, some partners distribute NFIs kits in plastic boxes that can be repurposed as storage. This minimizes the single use plastic waste from packaging, and optimizes resources.

NFI kit distribution in Myanmar © MRCS/IFRC

Key items in NFI kits in Myanmar and environmental considerations

Item	Environmental considerations	Guiding Principle of the EAP
Plastic sheeting/tarpaulin	- Contributes to plastic waste - Non-biodegradable - Difficult to recycle - Not a durable solution; can require multiple distributions - Use Eco-Design Tarpaulin as much as possible (recently greened specifications)	**Waste management**: Ensure proper disposal and explore recycling/reuse options. Prioritize durable, long-lasting materials to reduce the frequency of replacements. **Material sourcing**: Eco-design tarpaulin project ongoing **Design:** Adequate installation and protection with natural materials increase its lifespan.
Kitchen sets	- Plastic utensils are non-recyclable - Metal production can generate high emissions (though items are longer lasting) - Ensure quality of the steel to ensure its lifespan - If wooden utensils are included, using instructions should be taught to ensure durability - Minimize packaging, avoiding individual plastic packaging. If cardboard boxes, use non-bleached cardboard (brown)	**Carbon emissions**: Choose low-carbon materials. **Material sourcing**: Source from local and alternative or recycled materials to minimize environmental impact.
Blankets	- Synthetic fiber blankets are non-biodegradable and contain harmful chemicals for fire safety - Synthetic fiber blankets are preferred than natural fiber blankets because they are lighter - Select long- lasting blankets or blankets made from recycled materials - Sometimes blankets can include individual packaging. Avoid unnecessary packaging, especially the single use plastic foils or bags. When sub packaging is necessary, use 100% degradable materials such as paper or cardboard or starch-based plastics, in order to reduce plastic waste	**Material sourcing**: Advocate for the use of natural fibers or recycled materials to minimize environmental harm. **Waste management**: Prioritize durable, long-lasting materials to reduce the frequency of replacements.
Sleeping mats	- Some are made from synthetic foam that is non-recyclable and contributes to landfill waste - Fire retardants can contain harmful chemicals if not disposed of carefully - Mats made of natural materials can rot quickly, though have a lower environmental impact - In some cases plastic mats that are more	**Material sourcing**: Use natural, biodegradable materials like bamboo. **Waste management**: Promote repurposing or recycling where possible. Prioritize durable, long-lasting

	durable may be a better solution to avoid replacing mats regularly	materials to reduce the frequency of replacements.
Solar lights	- Plastic components and batteries contribute to electronic waste if not disposed of properly (ensure that proper segregation of pieces and materials is done for repair or recycle through the local and/or informal existing mechanisms) - Use high quality products to avoid replacements - Prioritize products that are using recycled plastic - Ensure low consumption LED lights, long life rechargeable batteries and automatic turnoff for energy saving - Ensure lithium-ion batteries instead of lead-acid batteries. No replaceable batteries. - Ensure solar panel can be used as electric power source, at the end of the lamp lifespan - Ensure that easy to repair with common tools and small workshops. - Ensure rechargeable more than 500 times	**Energy**: Promote use of renewable energy sources. **Waste management**: Establish systems to recycle batteries and electronics. Prioritize durable, long-lasting materials to reduce the frequency of replacements.
Mosquito nets	- Often made from synthetic materials that do not biodegrade (always ensure the quality for long life span - 5 years) − Only Long Lasting Insecticidal Nets (LLIN's) which require no further treatment during their expected life span (of average 3 to 5 years) should be purchased. - Promote the reuse of Polypropylene or Polyester fibers - Fibers contain chemicals as insecticide - Packaged individually and in bulk with plastic, generating high quantities of plastic waste. - For more info on environmental sustainability of mosquito nets see here.	**Waste management**: Prioritize durable, long-lasting materials to reduce the frequency of replacements.
Jerrycans/buckets	- Made from hard plastics (HDPE or PVC) that are not easily recyclable - May leak microplastics	**Waste management**: Promote reusable, long-lasting products to avoid frequent replacement. **Material sourcing**: Explore biodegradable alternatives.
Hygiene kits	- Plastic packaging and single-use items create waste	**Waste management**: Use recyclable packaging.

		Local resources: Sourcing sustainable alternatives like bamboo products.

Linking NFIs to the Environmental Action Plan

The management of NFIs in Myanmar can benefit significantly from alignment with the guiding principles of the Myanmar Shelter/NFI/CCCM Cluster's Environmental Action Plan, which encourages sustainable approaches throughout the humanitarian response lifecycle.

● **Environmental Context**

NFIs must be selected and distributed with an understanding of Myanmar's unique environmental conditions. For example, certain materials used in NFIs may degrade faster in Myanmar's humid climate, which can lead to increased waste. By understanding local climate, terrain, and biodiversity, organizations can choose materials that are both durable and environmentally compatible, while minimizing the strain on natural resources.

● **Material Sourcing**

The origin of materials used for NFIs plays a critical role in their environmental impact. Organizations should prioritize sourcing materials that are sustainable, recyclable, or biodegradable. For example, replacing plastic-based products with biodegradable alternatives reduces long-term waste. Additionally, local sourcing of materials can reduce transportation emissions and support local economies.

● **Carbon Emissions**

The production, transport, and disposal of NFIs contribute to greenhouse gas emissions. Choosing NFIs made from low-carbon materials or opting for locally produced items can significantly reduce emissions.

● **Waste Management**

Waste management is essential to mitigating the environmental impacts of NFIs. Establishing community-based recycling and repurposing initiatives helps manage waste more effectively. For instance, plastic sheeting and tarpaulins can be repurposed for agricultural or infrastructure use after their primary purpose has been fulfilled. Emphasizing waste management in NFI programming reduces the burden on local ecosystems and helps ensure that waste is minimized and managed responsibly.

EXAMPLE: Plastic recycling initiative in Daadab, Kenya, from the Kenyan Red Cross Society and the International Committee of the Red Cross. The campaign engages refugees and host community members in plastic waste collection and awareness-raising among the camp population. Plastic is gathered from

Plastic recycling process in Kenya © KRCS/ICRC

- **Energy**

NFIs that reduce reliance on traditional fuel sources directly support the Environmental Action Plan's focus on sustainable energy solutions. For example, solar lanterns offer an eco-friendly alternative to kerosene lamps, providing reliable lighting without the harmful emissions associated with fossil fuels. Additionally, the use of bamboo charcoal and fuel-efficient stoves significantly decreases the need for firewood in cooking, reducing both carbon emissions and the pressure on local forests. By promoting these alternatives, organizations can help decrease the demand for unsustainable energy sources while also improving health and safety within communities.

- **Local Resources**

The EAP emphasizes the importance of protecting local natural resources. Using locally sourced or sustainable materials for NFI production reduces the impact on natural ecosystems. Additionally, distributing NFIs that support sustainable local practices, such as water containers that encourage water conservation or mosquito nets that protect without harmful chemicals, can help counterbalance the environmental pressures introduced by humanitarian interventions.

08

ENERGY AND FUEL

Energy and fuel consumption in shelter and settlements are often overlooked yet critical environmental issues with significant impacts on community well-being and ecosystem health. In humanitarian settings, energy access is essential for basic needs like lighting, cooking, heating, and communication. However, traditional energy sources such as firewood, charcoal, and kerosene contribute to deforestation, air pollution, and greenhouse gas emissions, creating health risks and undermining community resilience.

In Myanmar, sustainable energy practices have been integrated into humanitarian interventions. Solar lamps included in Non-Food Item (NFI) kits (see more in Chapter 7) reduce reliance on kerosene lighting, improving safety and lowering greenhouse gas emissions. Fuel-efficient stoves promoted by humanitarian partners decrease firewood and charcoal use, reducing deforestation rates and indoor air pollution, and enhancing respiratory health within communities.

Adopting these sustainable energy practices brings additional benefits. They protect local ecosystems by decreasing deforestation, improve public health by reducing indoor air pollution, and enhance the resilience of humanitarian operations, ensuring reliable energy access even during fuel shortages. Aligning these efforts with environmental and sustainability goals is crucial for effective humanitarian responses in Myanmar.

Sustainable energy solutions

To mitigate these challenges, the Shelter/NFI/CCCM Cluster promotes sustainable energy solutions, reducing the reliance on fuel for transportation and traditional energy sources while providing clean, cost-effective alternatives for shelters and settlement projects. This approach also extends to operational practices, where organizations should consider reducing their fuel consumption for vehicles and logistics, in addition to their energy footprint for offices, flights, and local transportation.

- Renewable energy sources: Renewable energy solutions, such as solar and wind power, provide reliable, sustainable energy for shelters and off-grid settlements. Solar panels, in particular, offer

a flexible solution for lighting, communication, and other basic services. Humanitarian organizations can also integrate renewable energy into their offices and logistical operations, reducing dependence on vehicle fuel and lowering their carbon footprint.

- Improved cooking stoves: Improved cooking stoves enhance energy efficiency while minimizing fuel consumption and emissions. These stoves can utilize various fuel sources, including bamboo charcoal, a sustainable alternative due to bamboo's rapid growth. Improved charcoal cookstoves are designed for optimal airflow and combustion, reducing the amount of charcoal needed and improving indoor air quality. Biomass cookstoves can burn agricultural residues and other materials more efficiently than traditional open fires, while liquefied petroleum gas (LPG) stoves offer a cleaner burning option that is convenient for urban settings. Solar cookers harness sunlight for cooking, providing a fuel-free solution in areas with adequate sunlight. These fuel-efficient cooking alternatives can help ease pressure on local forests, mitigate emissions, and improve community health, particularly in light of rising fuel costs and shortages.

- Energy-efficient lighting: Using energy-efficient technologies like LED lighting minimizes the amount of energy needed, allowing for more efficient use of renewable energy sources. Similarly, organizations can implement energy-saving measures in their office buildings and operational spaces to reduce overall electricity consumption.

- Hybrid energy systems: A combination of renewable energy sources, such as solar and wind, can help ensure reliable power in areas where traditional fuel supplies are disrupted. Humanitarian operations can adopt these systems in both field operations and logistics, ensuring that they maintain energy security even amid fuel shortages.

Sustainable energy practices in operations

Humanitarian organizations should also apply sustainable energy and fuel considerations to their operational needs beyond assistance activities. This includes reducing fuel consumption in office operations, staff travel, and logistics:

● Office energy use: Offices and operational hubs can adopt energy-saving measures such as installing solar panels, improving insulation to reduce heating/cooling costs, and using energy-efficient appliances. These changes reduce the reliance on fuel-powered generators and grid electricity, especially in off-grid locations.

● Vehicle fuel efficiency: Given the fuel shortages, organizations should consider investing in fuel-efficient or electric vehicles for transportation and aid delivery. Reducing vehicle use where possible, through carpooling or optimizing delivery routes, can significantly lower fuel consumption and operational costs.

● Air travel and logistics: As air travel is a major source of carbon emissions, humanitarian organizations should reduce unnecessary flights, prioritize remote work, and explore alternative forms of communication and coordination where possible.

09

NATURE-BASED SOLUTIONS

Myanmar's natural capital, forests, soils, coastlines, and biodiversity provide crucial benefits to its people, acting as a protective buffer against natural hazards, securing sources of clean water for drinking and agriculture, and supporting sustainable livelihoods, including ecotourism. These ecosystems are a foundation for well-being and economic development, offering both tangible resources and intangible benefits that build resilience and promote sustainable growth. Protecting these resources is essential, especially as climate change increasingly threatens the ecosystems that sustain communities and critical infrastructure. Understanding the areas and ecosystems that best serve local needs, as well as those most vulnerable to environmental degradation, is essential to conserving and enhancing these benefits.

Nature-based solutions (NBS) encompass a strategic suite of actions and policies that use natural processes to address societal challenges, such as water security issues, disaster risks, and climate change. These solutions focus on protecting, restoring, and managing ecosystems to increase their resilience and capacity to address these challenges while simultaneously safeguarding biodiversity and improving human health. For example, the mangrove forests in Myanmar's Ayeyarwady Delta support fisheries, provide timber and food resources, filter water, and act as a natural defence against coastal erosion and storm surges. By storing large amounts of carbon, these mangroves also play a significant role in mitigating climate impacts. Conserving and restoring these ecosystems benefits the resilience and livelihoods of coastal communities, protecting them from climate change effects while supporting biodiversity and sustainable resource use.

In short, nature-based solutions represent a powerful, dual-benefit approach for both people and the environment. Implementing NBS involves the strategic application of natural processes to address complex environmental and social challenges. In Myanmar, integrating NBS into shelter, Non-Food Item

(NFI), and Camp Coordination and Camp Management (CCCM) programs can bolster resilience and sustainability. By embedding natural elements and ecosystem services into humanitarian interventions, organizations can not only meet immediate needs but also support long-term environmental health and community well-being. Resources such as the Sphere Unpacked Guide *on NBS* provide practical insights for humanitarian practitioners, guiding effective NBS integration into projects and fostering a comprehensive approach to resilience in Myanmar.

Implementing NBS in Shelter, NFI, and CCCM interventions

In Myanmar, NBS have the potential to enhance sustainability and resilience in Shelter, Non-Food Item (NFI), and Camp Coordination and Camp Management (CCCM) interventions. Integrating natural processes into humanitarian infrastructure addresses immediate needs and provides long-term environmental, social, and economic benefits, fostering community resilience and well-being.

NBS provide essential buffers against environmental hazards, aiding disaster resilience and recovery. Coastal habitats, for example, reduce shoreline erosion and storm impact by stabilizing sediments and weakening storm-generated currents, benefiting coastal communities and infrastructure. Forests and other vegetation protect soil, reduce landslides, and contribute to cleaner drinking water by filtering sediments. These ecosystem services ensure long-term environmental health, which humanitarian projects increasingly rely on.

Furthermore, implementing NBS promotes biodiversity conservation, a cornerstone of ecosystem health. Biodiverse ecosystems are better able to withstand and recover from disasters, ensuring that the resources humanitarian projects rely on—like water filtration and soil health—remain intact and sustainable.

Sustainable shelter solutions

NBS can promote sustainable construction practices in shelter interventions. Reforestation efforts that include bamboo, a fast-growing, renewable grass, offer a sustainable alternative to traditional construction materials. Bamboo's rapid growth allows for frequent harvesting, providing a low-carbon source for construction, which reduces carbon footprint while supporting local economies through sustainable bamboo farming and processing.

Bamboo plantation in Magway for flood prevention © MRCS and IFRC

Planting native tree species alongside bamboo also bolsters long-term environmental benefits, including carbon sequestration, soil stabilization, and biodiversity restoration. These contributions directly support climate resilience and preserve ecosystem services essential for local communities, such as clean water and fertile soil.

Tree plantation initiative as part of Youth Program © MRCS and IFRC

NBS enhance humanitarian shelter interventions by integrating green infrastructure, such as vegetation buffers and green roofs, to mitigate flooding, heat, and air pollution. These green spaces improve shelter environments, support physical and mental well-being, and can even provide local food sources, adding economic and health resilience.

## Mangrove restoration for coastal resilience

Mangrove restoration plays a crucial role in enhancing coastal resilience, offering protection to vulnerable communities from the impacts of extreme weather events. These ecosystems act as natural barriers against storm surges, coastal erosion, and flooding, which are increasingly prevalent due to climate change. Mangroves stabilize sediments, reduce the strength of wind- and wave-generated currents, and mitigate the effects of storm surges, safeguarding both settlements and infrastructure. In addition to their protective benefits, mangroves support fisheries that are essential for local food security, bolstering community resilience and ecological stability.

Coastal habitats, especially mangroves, along with seagrass beds and coral reefs – work collectively to reduce coastal exposure to erosion and inundation by stabilizing coastlines. They not only protect populations and infrastructure from storm damage but also ensure the long-term stability of coastal areas.

In an initiative led by WWF Myanmar, an analysis was conducted to understand where mangroves and other coastal habitats provide the most significant protection for populations along Myanmar's coastline. This involved combining geospatial data on coastal habitats and demographic data to identify areas where these ecosystems are most critical in reducing vulnerability to storms. Population density data from WorldPop (2015) was used to map where the highest concentrations of people live, showing who benefits the most from coastal habitat protection. The InVEST Coastal Vulnerability Model was then employed to map the potential impacts of coastal habitat loss, identifying where such loss would lead to the greatest increase in shoreline exposure to erosion and inundation. This model integrates geophysical coastline data, habitat maps, and storm characteristics to assess the relative exposure of different coastal areas.

By combining these maps, the analysis identified regions where coastal habitats offer the greatest protective benefits to the largest number of people. The study also focused on particularly vulnerable groups, such as the young and elderly, who are at greater risk of mortality from cyclones and storm surges, and households living in homes built from materials other than concrete or brick, which are especially susceptible to damage. The results confirmed that the areas most crucial for habitat protection did not change based on these vulnerable subgroups.

This initiative highlights the importance of preserving and restoring coastal habitats like mangroves, not only for their environmental benefits but also for their critical role in reducing exposure to the risks of extreme weather. By integrating habitat restoration into humanitarian strategies, these efforts can help protect infrastructure, improve food security, and enhance the resilience of coastal communities to climate change.
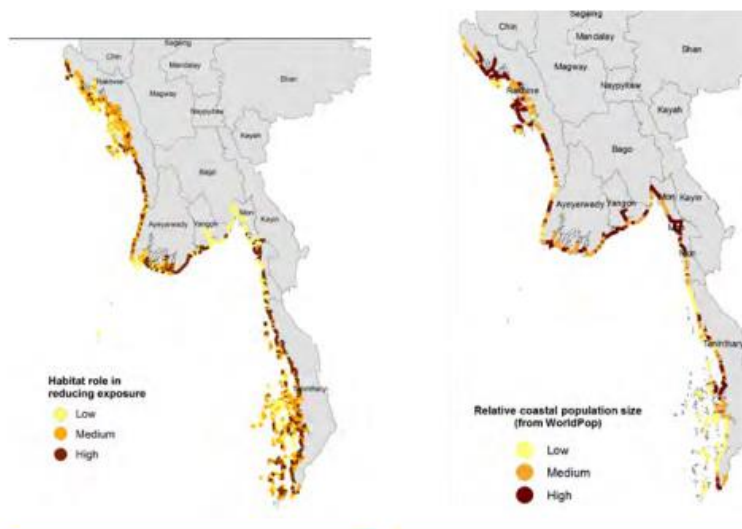
Map 4a.
Role of coastal habitats (mangroves, sea grass, coral) in reducing coastal exposure to erosion and storm surge under current climate conditions.
Higher values = greater role in reducing exposure. Patterns do not change under the sea-level rise scenarios evaluated here.

Map 4b.
Distribution of people living along the coast, who may benefit from the services provided by coastal habitats.
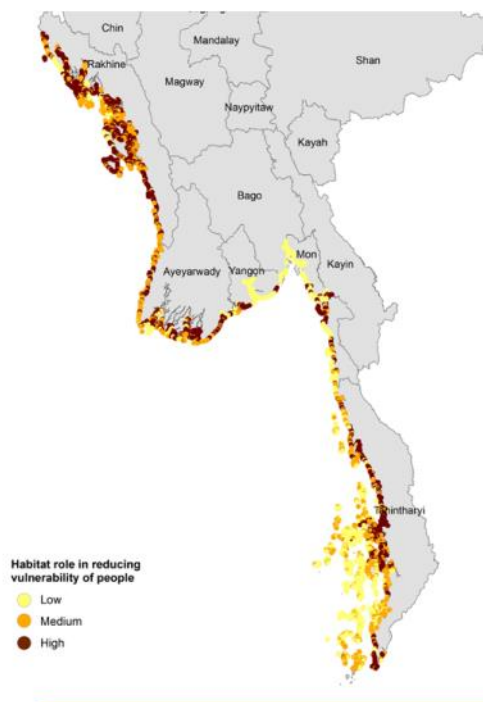
Map 4c.
Coastal habitats reduce risk of erosion and storm surge for populations living on the coast under current climate conditions. Higher values = greater role in reducing exposure for the greatest number of people. Combination of map 4a and map 4b. Patterns do not change under the sea-level rise scenarios evaluated here.

Coastal habitats in Myanmar
© WWF Myanmar

Erosion control and water security

In Myanmar's mountainous regions, effective soil and watershed management is essential for mitigating flood risks, conserving water, and enhancing food security for communities downstream. Soil erosion control and watershed management in these areas help reduce flood risks and increase water availability during the dry season while also improving the nutritional value of the soil, which directly supports food security for downstream communities. One practical approach to achieving this, particularly in collaboration with Internally Displaced Persons (IDPs), is through cash-for-work programs that focus on building micro water-retention systems in the upper mountain regions.

These labor-intensive projects, such as the construction of microponds, require minimal tools (primarily basic digging materials) yet deliver significant benefits. In Kayin State, a one-year project involving local village communities and IDPs was highly successful. The microponds constructed during the project proved resilient even under heavy storms, offering a practical and sustainable solution to water management and flood prevention. This combination of local knowledge and practical interventions fostered a high level of community acceptance, ensuring the long-term success of the project.

Microponds program in dry area in Kayin
© Thant Myanmar

To address flood risks on a larger scale, broader interventions, such as forest restoration efforts, are necessary. These initiatives are particularly valuable in Myanmar's dry zone, where they not only mitigate flood risks but also contribute to biodiversity restoration, reduce heat, and enhance food and water security. By combining forest recovery with watershed management, these actions provide a comprehensive approach to environmental and community resilience.

However, humanitarian actors often face limitations in resources, technical capacity, and mandates that may not extend to large-scale environmental restoration. These constraints highlight the importance of partnerships with environmental and development organizations. Collaborative efforts can leverage the expertise, funding, and long-term planning capacities of such actors, ensuring that initiatives like forest restoration and watershed management are effectively implemented and sustained. Humanitarian actors can play a pivotal role by aligning their shelter and settlement interventions with broader environmental strategies, advocating for ecological considerations in disaster-prone areas, and fostering synergies between immediate relief efforts and long-term environmental goals.

Forest restoration in mountain Kawkareik © Thant Myanmar

The success of these pilot projects from development actors highlights the importance of co-developing solutions with local communities, ensuring that interventions are informed by traditional knowledge and tailored to the specific needs and conditions of each region. This approach leads to high acceptance rates and greater sustainability, making it a valuable model for similar initiatives across Myanmar's mountainous regions and dry zones.

Economic and health benefits

The economic and health benefits of NBS in humanitarian contexts are substantial. Investments in community gardens and agroforestry, for instance, create food sources and local jobs while building economic resilience through sustainable practices. In shelter contexts, green spaces also improve air quality, reduce heat, and contribute to overall well-being, enhancing the quality of life for those in temporary accommodations.

Leveraging data-driven planning with Natural Capital Assessment

Understanding the distribution of Myanmar's natural capital is crucial for making informed land-use, conservation, and economic decisions that benefit both ecosystems and local communities. Historically, Myanmar has recognized the vital role that forests play in protecting slopes, managing water catchments, preventing soil erosion, and safeguarding downstream agriculture. These services have been central to the country's National Forest Policy since 1995. However, quantifying and assessing the value of these ecosystem services has traditionally been a challenge. Tools like InVEST help map and better understand the value of these services, allowing for more informed decision-making.

Forests, along with other natural vegetation, play a key role in holding soil in place, reducing erosion, and preventing sediments from entering rivers and streams. The sediment retention provided by these ecosystems directly benefits communities by improving drinking water quality and extending the lifespan of infrastructure assets that rely on clean water. To assess the areas where forests and other natural vegetation are most critical for maintaining clean water sources, a natural capital assessment approach combines data on where sediment retention occurs with demographic information about downstream populations who depend on rivers and streams for drinking water. This approach helps identify the areas where conservation interventions will not only improve water quality but also reduce the risk of landslides, which can have devastating effects on both the environment and communities.

By combining ecological data with demographic information, tools like InVEST enable humanitarian organizations and policymakers to pinpoint the areas where Nature-Based Solutions (NBS) will have the most significant impact, ensuring that conservation efforts protect both the environment and the most vulnerable populations.

Incorporating natural capital information provides benefits across the development process

NATIONAL & REGIONAL PLANNING

SECTOR-BASED PLANNING

PROJECT DESIGN & ALTERNATIVES ANALYSIS

OFFSETS

MONITORING

Questions a natural capital approach can answer

- Where would development be safest from environmental hazards?
- Where do ecosystems help protect and secure existing or new development investments?
- Where should new development be avoided to prevent loss of ecosystem services?

- How can natural capital be managed to reduce hazards and support sucess of the sector-based plan?
- How can sector-level objectives be met with the lowest impact on ecosystem services?

- Where can ecosystems reduce hazard risk, and how much is needed?
- Where can nature reduce project engineering and maintenance costs?
- Where should projects be located to minimize negative impacts to people?
- What measures are necessary to secure ecosystem service benefits?

- What losses of natural capital and ecosystem services will be caused by project development?
- Where should offsets be located to previde effective, efficient and equitatible mitigation?

- Are mitigation measures effectively compensating for negative impacts of development?
- Have there been any unexpected consequences of the project on natural capital or ecosystem services? If so, how can they be remedied?

Figure 1.
Examples of how a natural capital-based approach can be used to mainstream environmental information throughout the development planning process, contributing to more effective and efficient development decisions.

Natural capital-based approach © WWF Myanmar

10

CAPACITY DEVELOPMENT

Environmental capacity development is a critical focus for Shelter/NFI/CCCM partners in Myanmar to ensure sustainable practices are integrated into humanitarian operations. This chapter provides practical tips and resources for partners looking to enhance their environmental capacity, strengthen collaborations with environmental organizations, and effectively implement the [Cluster's Environmental Action Plan (EAP).](#)

1. **Strengthen partnerships with environmental organizations:**
   - Collaborate with established environmental groups like WWF, Thant Myanmar or UNEP to benefit from their technical expertise.
   - Engage in joint projects such as reforestation initiatives, mangrove restoration, or sustainable materials sourcing.
   - Advocate for partnerships at both national and regional levels to align humanitarian and environmental goals.

2. **Implement the Environmental Action Plan (EAP)**
   - Use the EAP as a guiding framework to prioritize sustainable practices in all shelter and settlement activities.
   - Conduct regular environmental screenings (NEAT+) to identify risks and mitigation measures.
   - Integrate EAP principles into organizational strategies, staff training, and community engagement.

3. **Invest in training and knowledge-building**
   - Participate in workshops and training sessions offered by environmental or humanitarian organizations.
   - Take advantage of online guides and/or courses available, such as those provided by [Sphere Standards](#), or [Environmental Emergency Centre](#) - including this [EHA Global Training Template](#).
   - Offer internal training sessions or ToTs to cascade knowledge to field teams and local implementing partners.

4. **Promote peer-to-peer learning**
   - Organize learning exchanges between organizations to share best practices on environmental sustainability.
   - Create working groups focused on specific issues, such as Nature-Based Solutions (NBS) or renewable energy in shelter and settlement interventions.

Example of Myanmar Cluster Capacity Building in 2024: WWF engagement and EAP implementation

On 13th June 2024, the Shelter/NFI/CCCM Cluster partnered with WWF Myanmar to conduct an initial training session that furthered the objectives of the EAP. The training was designed to help Cluster partners integrate environmental strategies into their operations and respond to the practical challenges of doing so in Myanmar's complex humanitarian landscape. While the Environmental Action Plan provided the strategic direction, the training served as a practical step toward its implementation.

Lessons learnt and participant experience:

- The training was seen as a valuable extension of the Environmental Action Plan (EAP) objectives.
- Sessions on assessing environmental impact were especially well-received.
- Participants showed strong interest in conducting Environmental Impact Assessments (EIAs) throughout project cycles.
- There is a desire to translate EAP principles into daily operational practices.
- The training sparked interest in **Nature-Based Solutions (NBS)**, key to reducing environmental degradation and enhancing community resilience.
- Participants found learning about reforestation, mangrove restoration, and using bamboo in construction helpful for integrating NBS into shelter and camp management.
- Gaps were identified in partner capacity, particularly with technical tools like EIA frameworks and sourcing sustainable materials.
- Participants requested additional training and support, emphasizing the need for ongoing capacity building to achieve EAP goals.

Expanding capacity and collaboration:

Following the training, participants committed to sharing the content with their organizations and disseminating the materials to local implementing partners. Many also expressed a desire for continued engagement with WWF and other environmental organizations, indicating a strong demand for additional technical support. These steps align with the EAP's emphasis on sustained capacity-building to ensure that environmental protection becomes integral to humanitarian action.

The Cluster intends to build on the momentum generated by the training, further embedding the principles of the Environmental Action Plan into partner operations. This will involve developing more comprehensive training programs, expanding support to local organizations, and fostering partnerships with environmental agencies to address ongoing challenges. By aligning future capacity development efforts with the EAP, the Cluster can further the environmental sustainability of humanitarian interventions.

11

FUNDING AND ADVOCACY

Humanitarian donors are increasingly emphasizing the need to integrate environmental considerations into shelter, Non-Food Items (NFI), and Camp Coordination and Camp management (CCCM) programs, particularly in vulnerable and ecologically sensitive regions like Myanmar. As the country faces ongoing conflict, displacement, and the effects of climate change, ensuring that shelter and settlement projects are environmentally sustainable is not only a funding requirement but also a necessity for the long-term resilience of affected communities.

Commitment of key humanitarian donors to environmental sustainability

[Several key humanitarian donors active in Myanmar have made environmental sustainability a priority within the Shelter/NFI/CCCM Cluster.](#) These donors recognize that shelter and settlement projects, if poorly planned, can lead to deforestation, soil degradation, and increased vulnerability to climate-induced disasters. As a result, many donors require environmental impact assessments and promoting nature-based solutions to mitigate these risks.

- **European Civil Protection and Humanitarian Aid Operations (DG ECHO)**

DG ECHO has been a leading donor in Myanmar's Shelter/NFI/CCCM sector, strongly advocating for environmentally responsible approaches in displacement settings. [DG ECHO's funding guidelines](#) explicitly state the need for projects to meet [specific minimum requirement](#)s on environmental sustainability, particularly in the construction of shelters and camp infrastructure. DG ECHO encourages the use of environmentally friendly materials and building techniques to minimize deforestation and reduce greenhouse gas emissions. Moreover, DG ECHO has highlighted the importance of Disaster Risk Reduction

(DRR) strategies, including flood-resistant shelters and sustainable natural resource management in camp settings.

- **United States Agency for International Development (USAID) - Bureau for Humanitarian Assistance (BHA)**

USAID, through its Bureau for Humanitarian Assistance (BHA), supports shelter and CCCM activities in Myanmar, with a focus on resilience and environmental sustainability. USAID's Regulation 216 requires Environmental Screenings for all projects (which would determine if full Environmental Assessment is required), ensuring that these interventions do not contribute to environmental degradation. USAID prioritizes projects that integrate climate adaptation measures, such as flood-proof shelter designs and sustainable waste management systems within camps.

- **Swedish International Development Cooperation Agency (Sida)**

Sida is known for its strong focus on environmental sustainability in all humanitarian programs, including shelter and CCCM. Sida funds projects that incorporate energy-efficient solutions for camps, such as solar-powered lighting and sustainable shelter designs that reduce reliance on natural resources. Sida also supports capacity building for local communities and camp residents, emphasizing the importance of environmental stewardship in displaced populations.

Requirements for organizations presenting funding proposals for shelter, NFI, and CCCM programs

Humanitarian donors operating in Myanmar's Shelter/NFI/CCCM sector normally have their own specific and contextualized environmental criteria that organizations must meet when applying for funding. These requirements ensure that shelter interventions and camp management strategies consider the long-term environmental impacts and promote sustainability. In addition to project-level environmental considerations, donors are increasingly valuing an organization's overall commitment to minimizing its environmental footprint. This means that beyond implementing eco-friendly practices in their interventions, organizations are also expected to demonstrate a broader commitment to reducing their overall environmental impact, such as through green procurement policies, energy-efficient operations, and internal sustainability initiatives. Common environmental requirements include:

- **Environmental Assessments for shelter, NFIs and CCCM projects:**

Donors like USAID and DG ECHO require organizations to conduct environmental screenings (a simple version of an environmental assessment) for example using the NEAT+ as part of their shelter, NFIs and

CCCM proposals. This assessment must evaluate the potential impacts of shelter construction on the surrounding environment, such as deforestation, soil erosion, and water usage. Organizations must demonstrate how they will mitigate these impacts, for instance by using sustainable construction materials or incorporating flood-resistant designs. (More information about Environmental Assessments in Chapter 4)

- **Sustainable shelter and settlements:**

Proposals for shelter projects must include sustainable and environmentally friendly designs. Donors expect organizations to use locally sourced, renewable materials such as bamboo or recycled materials where possible. Shelter designs should also consider the local climate and disaster risks, such as elevated shelters in flood-prone areas or those designed to withstand strong winds. Settlement layouts must prioritize efficient land use to minimize environmental footprint and avoid overburdening local ecosystems.

- **Natural resource management:**

Many donors require organizations to implement strategies for sustainable natural resources management. This includes measures to prevent deforestation, manage water resources efficiently, and handle waste in an environmentally sound manner. For instance, shelter/NFIs projects might promote the use of fuel-efficient stoves to reduce the demand for firewood, or implement rainwater harvesting systems in shelter design to ensure a sustainable water supply.

- **Disaster Risk Reduction (DRR) strategies:**

Given the vulnerability of Myanmar to climate-induced disasters such as floods, landslides, and cyclones, donors emphasize the integration of DRR strategies in shelter and site planning proposals. This includes building resilient shelters that can withstand extreme weather conditions, developing early warning systems, and ensuring that settlements have safe evacuation routes and disaster preparedness plans in place.

- **Local community involvement:**

Donors place great importance on the engagement of displaced populations and host communities in the design and implementation of projects. This ensures that interventions are contextually appropriate and that local knowledge is incorporated into environmental management strategies. Community-led initiatives such as reforestation or sustainable land management practices are encouraged and often a prerequisite for funding.

- **Environmental monitoring and reporting:**

Organizations are expected to include robust environmental monitoring frameworks in their proposals. This allows donors to track the environmental impacts of shelter and CCCM interventions over time and ensures that mitigation strategies are effectively implemented. Reporting on environmental outcomes is a key component of donor-funded projects, particularly for long-term programs in protracted displacement contexts.

● **Alignment with International Standards:**

Donors require that shelter/NFIs and CCCM projects adhere to international standards such as the Sphere Handbook and the Environmental Emergencies Guidelines. These standards provide benchmarks for ensuring that shelter and camp management interventions are environmentally sustainable and meet the needs of displaced populations without causing harm to local ecosystems.

Advocacy for Environmental Mainstreaming in Shelter and CCCM Programs: Advice for Cluster Partners

For Shelter/NFI/CCCM Cluster partners in Myanmar, advocating for environmentally sustainable interventions is key to ensuring that humanitarian efforts address both immediate needs and long-term environmental impacts. Given Myanmar's ecological vulnerabilities and increasing demands from donors for environmentally integrated projects, effective advocacy is critical. The Shelter/NFI/CCCM Cluster's Environmental Action Plan (EAP) offers guidance and resources that can strengthen advocacy efforts, ensuring that partners can promote sustainable solutions while securing necessary funding and support. Below are recommendations to guide Cluster partners in advocating for more sustainable shelter, NFI, and CCCM interventions:

● **Leverage the Environmental Action Plan (EAP) as an advocacy tool**

The Initial Environmental Action Plan developed by the Shelter/NFI/CCCM Cluster in Myanmar provides an initial but comprehensive framework for integrating sustainability into humanitarian programming. Cluster partners can use this plan to advocate for environmentally conscious interventions by aligning their projects with the recommendations in the EAP. When engaging donors, emphasize how your projects are aligned with the EAP, highlighting the specific environmental objectives your proposal supports.

● **Engage donors early**

To advocate effectively for sustainable interventions, Cluster partners should engage donors early in the project design phase. Beyond demonstrating a commitment to environmental sustainability and

referencing the EAP, partners can advocate for funding greener initiatives that may initially cost more but offer more durable and resilient solutions in the long term. These initiatives can save costs over time by reducing maintenance needs and environmental damage. Donors must also be willing to adjust their funding priorities if environmental screenings or assessments reveal that activities need to be modified to minimize negative impacts. Early engagement and collaboration with donors are key to securing support for environmentally sustainable interventions.

- **Tailor proposals to donor priorities.**

Highlight the EAP's alignment with key donor priorities, such as those of DG ECHO, USAID, and Sida, which increasingly prioritize sustainability and environmental protection in humanitarian projects.

- **Use the Cluster platform for joint advocacy efforts**

Cluster partners should coordinate advocacy efforts through the Cluster to strengthen their collective voice. Specific actions include:

- Develop joint advocacy messages: Create a unified stance on environmental sustainability that can be communicated to donors and government stakeholders. Jointly advocate for policies and funding that support sustainable shelter and CCCM interventions.
- Organize collaborative workshops: Use the Cluster's platform to hold workshops or meetings focused on sharing best practices and solutions for environmental mainstreaming.

- **Incorporate environmental sustainability in all proposals**

Cluster partners must ensure that environmental sustainability is a core component of all project proposals. This not only satisfies donor requirements but also strengthens advocacy efforts by demonstrating a proactive approach to sustainable interventions.

- **Empower local communities as environmental stewards**

A key component of effective advocacy is emphasizing the involvement of local communities in sustainable resource management. The EAP supports community-led initiatives, and Cluster partners should advocate for these approaches to donors. Recommendations include:

- Highlight community participation: Showcase how your projects engage displaced populations and host communities in managing natural resources, reforestation, or resilient construction.

- Promote capacity-building initiatives: Advocate for projects that include training and capacity-building for local communities on sustainable construction practices and environmental stewardship.

● **Advocate for flexible and long-term funding**

Environmental sustainability often requires additional resources. To ensure sustainable interventions are feasible, Cluster partners should advocate for flexible, multi-year funding. Specific advocacy strategies include:

- Push for multi-year funding: Advocate for funding that allows long-term planning and the integration of sustainability into shelter and camp management projects, as supported by the EAP.
- Seek funding for innovation: Encourage donors to provide specific funds for innovative sustainable practices, such as renewable energy solutions, low-impact shelter materials, and climate-resilient designs.

● **Promote the humanitarian-environment nexus**

Advocacy should emphasize that environmental sustainability is not only a technical requirement but a humanitarian requirement. Cluster partners should highlight the protection and well-being of displaced populations through environmentally sustainable interventions. Key advocacy strategies include:

- Link sustainability to protection: Emphasize how sustainable shelter and CCCM interventions reduce exposure to environmental hazards and build resilience to climate-related disasters.
- Use success stories: Share examples that demonstrate how sustainability has improved outcomes for communities in Myanmar, to strengthen the case for funding and support.

● **Engage local authorities on environmental policies**

In addition to donor engagement, as much as possible within Myanmar context, Cluster partners are encouraged to work with Myanmar's local authorities to advocate for environmental policies that support sustainable humanitarian interventions.

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